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By JOHN HULL, M. D.

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MEMBER OF THE CORPORATION OF SURGEONS, AND OF THE
PHYSICAL SOCIETY OF LONDON;
OF THE NATURAL HISTORY SOCIETY OF EDINBURGH;
AND SECRETARY OF THE LITERARY AND PHILOSOPHICAL
SOCIETY OF MANCHESTER.

IN TWO VOLUMES.

VOLUME I.

INTRODUCTION TO THE SEXUAL SYSTEM OF LINNÆUS.
BOTANICAL TERMS AND DEFINITIONS.

Manchester,

Printed by R. and W. Dean, 9, Spring-gardens;

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1800.

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TO THE

REV. THOMAS STARKIE, A. M.

VICAR OF BLACKBURN,

THESE VOLUMES,

INTENDED TO FACILITATE THE STUDY

OF THE MOST PLEASING

BRANCH OF NATURAL HISTORY,

ARE RESPECTFULLY INSCRIBED

BY HIS SINCERE FRIEND,

AND MOST OBEDIENT AND OBLIGED SERVANT,

JOHN HULL.

BRAZEN-NOSE-STREET,

MANCHESTER.

DECEMBER 1ST. 1799.

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PREFACE.

Deeming it unnecessary to enter into a detailed consideration of the advantages, or to expatiate upon the pleasure, derivable from Botanical pursuits, I shall immediately proceed to lay before the reader an account of the plan and design of this work; and shall subjoin some observations on the botanical language, employed in it, together with my reasons for adhering to the Sexual System of Linnæus, in preference to the altered, or, as it is generally termed, reformed system of Thunberg.

In the *Introduction* it has been my particular aim to give such an explanation of the System, I have adopted, and of the method of investigating and preserving plants, as will enable any person, by moderate attention, and without further instruction or assistance, to become a practical botanist.

The *Botanical Terms* being, in my opinion, most conveniently and advantageously studied, when they are so arranged, that the kindred and contrasted ones are placed in one point of view, I have been induced to add the definitions to the Linnean terms, as most ingeniously arranged in the *Delineatio Plantæ*, prefixed to the *Systema Vegetabilium*. For the same reason, I have explained the terms, employed in describing the Funguses, and likewise those, used by Hedwig and Gærtner, under a similar

scientific arrangement — The terms and definitions of these two celebrated authors having never been presented in an english dress; and the original writings being very expensive, and, on account of their scarcity, not easily procured, it is hoped that they will constitute an acceptable part of this work.

By those, who have made considerable progress in the science, this arrangement of the terms may, perhaps, be thought fully sufficient, as, upon the occurrence of any term, the signification of which is not understood, they may, without any difficulty, turn to the place, where it is defined. But to a student this would not be equally easy, and, therefore, I have thought it necessary to give an Index, or Dictionary of english botanical terms, with the latin annexed to them, and a reference to the number of page, in which the definition of each may be found. It would, undoubtedly, have abridged the student's labour, if all the terms had been a second time explained, under their alphabetical arrangement. This repetition, however, would necessarily have added very considerably to the bulk and price of the work, without an adequate advantage, and has, on that account, been omitted. But I have availed myself of the opportunity, afforded by this dictionary, of giving the derivations of the names of the classes and orders; of explaining some terms, that were either unnoticed, or not sufficiently defined in the scientific arrangement; and of inserting some articles, which could not have been introduced, with equal propriety, in any other place.

For the convenience of those, who may be desirous of consulting the latin writings of Linnæus, or other Botanists, another Dictionary is added, with the latin terms prefixed to the english, and a reference to the number or page, in which each is defined. With this assistance it is expected, that the unlearned reader will, upon many occasions, be enabled to read the Linnean characters in the original latin; as the construction, for the most part, presents little or no difficulty, and it is sufficient, in order to

understand them, that the reader shall make himself acquainted with the signification of the latin terms.

In the different editions of the *Genera Plantarum* of Linnaeus, the *Natural* Characters only are given: But, instead of a mere catalogue of names, I have chosen to place, at the head of each of the classes, a synoptical table of the *Compendious* or *Essential* Characters of the genera. My intention, in deviating from the usual plan, in this instance, has been to enable the student to investigate the generic characters of all the indigenous plants of Great Britain, without having occasion to consult any other volume.

The Genera are numbered as in the 5th edition of the *Genera Plantarum*, published at Stockholm in the year 1764,[†] and the 14th edition of the *Systema Vegetabilium*, published by Murray at Gottingen in 1784.

The names of the genera (and in the British Flora the *trivial* names also) are accented. In doing this, great care has been taken to point out the *letter*, whether vowel, diphthong, or consonant, upon which the emphasis ought to be laid, by placing the accentual mark after it. For example, *mi'nor*, *europæ'us*, *min'imus*, *gramin'eus*, are to be pronounced *mi'-nor*, *eu-ro-pæ'-us*, *min'-i-mus*, *gra-min'-e-us*. The analogy of our language being the standard for pronouncing the latin language in England, the accents ought to be laid according to the following rules, which will serve to correct any erroneous accentuation of the Linnean names in this work, or the British Flora, that may have escaped my notice.

1. In latin words of two syllables, whatever be the quantity of the first syllable, the accent ought to be placed upon it, agreeably to the rule of *Sanctius*;

“ Exacuit sedem dissyllabon omne priorem :”

[†] In the preface to the British Flora the Genera are erroneously stated to be numbered as in Reichard's edition.

thus, *māg'nus*, *mī'tis*, *mī'nor*, are all to be accented on the first syllable. And, if a single consonant come between the two vowels, the consonant always goes to the last syllable, as in *mī'tis*, *mī'nor*, and the preceding vowel is to be accented, and pronounced with its long, open sound, as in english.

2. In words of three or more syllables, if the penultimate be short, the accent ought to be placed on the antepenultimate ;

“ Ex tribus, extollit primam penultima curta : ”

thus, *min'imus*, *gramin'eus*, &c. are to be accented on the antepenultimate. In this case, if the antepenultimate vowel be followed by a single consonant only, the consonant is to be joined to it, and the vowel is to be pronounced short, whatever its quantity may be : thus, *poēt'icus*, *aquat'icus*, *min'imus*, *gramin'eus*, are to be pronounced *po-et'-i-cus*, *a-quat'-i-cus*, *min'-i-mus*, *gramin'-e-us* : Except 1st. the antepenultimate vowel be *u*, when the single consonant goes to the next syllable, and the *u* is to be pronounced long, even though it be short : for example, *lūr'idus*, *lūt'eus*, *cār'ul'eus*, are to be pronounced *lu'-ri-dus*, *lu'-te-us*, *cæ'-ru'-le-us*. Or, 2dly. a semiconsonant diphthong succeed the antepenultimate vowel, in which case this vowel (unless it be *i* or *y*) is to be pronounced long, whatever its quantity may be : thus, *cās'ius*, *mēd'ius*, *dūb'ius*, are to be pronounced *cæ'-si-us*, *mē'-dī-us*, *du'-bi-us*. And *i* and *y* are to be pronounced short, even though they should be long, thus *fīl'ius* and *styg'ius* ought to be accented and pronounced *fil'-i-us*, *styg'-i-us*.†

3. In words of three or more syllables, if the penultimate be long, the accent ought to be placed upon it ;

“ Extollit seipsam, quando est penultima longa : ”

thus *europ'æus*, *montānus*, *palūstris*, are to be accented *eu-ro-pæ'us*, *mon-ta'-nus*, *pa-lus'-tris*.

† It is to be observed, that *c* and *g*, when thus taken to the former vowel, are to be pronounced soft, if followed by *e* or *i*.

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To assist those readers, who are unacquainted with the learned languages, in the pronunciation of the latin generic and trivial names, I shall put down a few rules for pronouncing particular letters, and must refer them to *Walker's* "Key to the Classical Pronunciation, &c.," for further directions. 1st. The letter *e*, at the end of latin words, is always to be sounded; thus, *Aga've* and *Autumna'le* are to be pronounced *A-gal-ve* and *Au-tum-na'-le*. 2. The letters *c* and *g* are to be pronounced *hard*, before *a*, *o*, and *u*; and *soft*, before *e*, *i*, *y*, *æ* and *œ*, even in words, derived from the greek, as *Monogynia*, *Digynia*, &c. 3. *Sc* is to be pronounced *soft*, like *s*, before *e*, *i*, and *æ*; and *hard*, like *k*, before *a*, *o*, and *u*. 4. *Ch* and *sch* are to be pronounced *hard*, like *k* and *sk*: for example, *Cha'ra*, *Chelo'ne*, and *Schæ'nus*, are to be pronounced, as if written *Ka'ra*, *Ke-lo'-ne*, and *Skæ'nus*.—*Ch* and *Ph*, followed by a consonant, are mute.

To the names of the genera are added References to figures, and the Synonyms of Tournefort, or other Botanists.

The *Essential* Characters are, principally, taken from the very correct edition of the *Systema Vegetabilium*, mentioned above.

The *Natural* Characters, except in a few instances, are given from Reichard's edition of the *Genera Plantarum*; and to these are added the corrections and observations, introduced in the later editions of that work by Schreber and Haenke, with their Initials affixed to them.

In the first twenty-three classes, which comprehend all the plants with conspicuous stamens and pistils, the characters, drawn by Gærtner, in his excellent work *De Fructibus & Seminibus Plantarum*, are subjoined to the natural characters, and constitute a very valuable addition to them. This author, convinced of the utility and necessity of a more intimate acquaintance with the form, structure, &c., &c., of the fruits and seeds† of vegetables,

† "Floris curatam disquisitionem, & minutiorum quoque ejus partium sedulam investigationem, ingentis utilitatis quin necessitatis esse ad rite dignoscendas

paid uncommon attention to this subject. Of the extent and success of his labours we have the most ample and satisfactory testimony, in the work mentioned above. Linnæus, regarding the flower, as greatly preferable to the fruit, in the construction of generic characters,†† undoubtedly was not so attentive to the latter, upon some occasions, as he ought to have been.

The characters of the *Musci*, and some other genera, referred to the Class Cryptogamia, are not so correctly drawn by Linnæus as those, belonging to the preceding classes; nevertheless, for the gratification of the reader, I have thought it proper to retain all of them, and to add the amended characters of these genera, from the works of Schreber, Persoon, Hedwig, &c.

The explanation of the Natural Orders is taken from Linnæus's *Prælectiones in Ordines Naturales*, published by Giseke at Hamburg, in the year 1792; and, although it is an abridged translation, I have preferred letting it remain in the form of Lectures, as delivered by the illustrious author. By the generality of readers this account will probably be thought sufficiently ample; and those, who may wish to enter more minutely into this difficult subject, I must beg leave to refer to the original, since it would have been incompatible with the limits, proposed to this work, to have given an entire translation of it. Linnæus admitted, that there are Natural Classes, as well as Natural Genera, and that a natural method ought to be preferred to every one

ordinandasque plantas, recentiorum industria, satis & abunde confirmatum est. Sed uti hæc verissima sunt, ita & id certissimum, quod perinde scrupulosum, in fructibus & seminibus institutum, scrutinium, haud minus utile, immo vero, ad rei herbariæ perfectionem, vel maxime quoque necessarium sit. A fructibus enim multorum generum veri pendent limites, & non solum in externo eorum habitu, sed inprimis quoque in interna ipsorum fabrica, sæpe adeo certa affinitatum naturalium vincula, & adeo luculenta specierum, generum, ordinumque deprehenduntur signa distinctiva, ut meliora, tutioraque frustra in floribus ipsis quæsieris." PRÆFAT. P. I.

†† See Philos. Bot. § 179. and Genera Plantarum § 22.

hitherto invented, but he ridiculed all the natural methods, that had been proclaimed in his life-time, and asserted, that a single perfectly natural class was not to be found in any system whatever. He did not indulge a hope that a natural system would ever be seen by himself, or scarcely by posterity. And Willdenow is decidedly of opinion, that the System of Nature will never be discovered. "*Quod de Systemate Naturæ nonnulli somniant, semper pium manebit desiderium. Si vel omnia terræ nostræ vegetabilia detecta essent, tamen impossibile erit Systema Naturæ investigare. Alma enim Natura, in se spectata, non est systematica, non Genera habet, neque catenam rerum agnoscit. Singula creata nexu quasi retiformi, ut ita dicam, coherent, & Nos singula in lineam rectam disponere solemus, qua methodo haud utitur Natura.*" *Præf. Flor. Berolin. Prodr. P. 10.*

In a purely descriptive science, like Botany, where a great number of terms is indispensably requisite, it becomes an object of primary importance to have these well chosen, and accurately defined. And the rapid extension of botanical knowledge, within the last seventy years, is perhaps not less owing to the superior precision of the *Language* employed, and, in a great measure, invented by Linnæus, than to the excellence of his arrangement. If the study of botany had remained confined to such persons as were able to read his original writings, it would not have been necessary to form a vernacular botanical language. But, since Botany has been long a favourite pursuit, both in this and other nations, amongst persons, who have not had the advantages of a classical education, it has been found necessary to translate the different works of Linnæus. And, that the class of readers, just mentioned, may enjoy the full benefit, to be derived from these translations, it is requisite that appropriate vernacular terms be employed in them, which shall equal, or be as little inferior as possible to the original ones, in precision and conciseness.

In Great Britain very considerable attention has been paid

to this point by several ingenious writers, and the result is a material improvement of our botanical language; in consequence of its being made to approach more nearly to the Latin. This reform may, at first view, render the science more forbidding and difficult to the mere english reader. The difficulty, however, will be ultimately found to exist in appearance rather than in reality. Many terms must necessarily be learnt in this department of the science of nature, and, since we have comparatively few sterling english words, of exactly the same import, as the Linnean terms, if we reject those, used by this celebrated botanist, and such as may be formed from them by a change of termination, we must either invent new words, and give them an equivalent signification; or we must employ words, not generally received; or we must apply words, which have been admitted into general use, in an entirely new sense, or, at least, in a more precise and definite signification. Now it is evident, that the introduction of new terms, or the employment of such, as are very little known, can not render the science more easily attainable, since both the terms and their definitions must necessarily be learnt. And, if words, sanctioned by general use, were applied in a new sense, little or no advantage would result from it, for they would require explanation as much as perfectly new terms; and they would be liable to produce confusion, by suggesting to the mind their ordinary signification. On the other hand, the benefit, to be derived from rendering our native botanical language a more exact resemblance of the original, is obviously very great. Not only its conciseness and precision are thereby improved; but the translated and latin terms, in most instances, will mutually serve to suggest each other: whence those, who have been accustomed to read botanical writings in the latin or english language only, will find very little difficulty in understanding the botanical terms in works, written in the other language.

Whilst the learned botanists will invariably give the preference to such terms, as more nearly resemble the Linnean, it may

easily be supposed, notwithstanding what has been above said, that the unlearned readers will shew a predilection for purely english words, as the aspect of the science will thence appear less rugged and terrific. It has therefore been my endeavour to accommodate both classes of readers, as much as lay in my power, by admitting both purely english, and Linnean terms, or such as, being immediately formed from them, bear the marks of the original.

In rendering the Linnean terms (and the same may be observed with respect to the terms of Hedwig, Gærtner, and other botanists) I have proceeded conformably to the two following rules.

1. If our native language furnish correspondent words, which have been admitted into general use, I have adopted them without any regard to their similarity, or dissimilarity to the terms, employed by Linnæus: Thus, I have used *root, leaf, stem, branch, seed, thorn, tooth, &c., &c.*, with their respective derivatives and compounds.

2. Where we have no sterling english words, that are precisely equivalent, and, in a few instances, where we have such, provided these have never been generally received (as *Empalement, Chive, Pointall*, and other terms used by Grew), I have either adhered as closely to the Linnean terms as possible, by merely giving them an english termination; translating, for example, *corolla* corol, *anthera* anther, *pistillum* pistil, &c. &c.; or I have retained the Linnean terms entire, without any change whatever, as *calyx, germen, stigma, &c.* And, in the latter case, I have, in almost every instance, formed the plural number, agreeably to the genius of the english language, in preference to using the latin plurals.

Some instances will, indeed, occur, wherein I have deviated from the former of these two rules, but they are not numerous, and I do not think it necessary to notice them particularly, be-

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Some instances will, indeed, occur, wherein I have deviated from the former of these two rules, but they are not numerous, and I do not think it necessary to notice them particularly, be-

cause many examples occur, in common language, of our admitting derivatives from the French or Latin, where our primitives are borrowed from a different source; as *hair, capillary; eye, ocular; tooth, denticulated; heart, cordial; ear, auricle, auricular, &c. &c.*

Although english words admit of being compounded with very great facility and propriety, in translating some compound words, as *cordato-sagittatum, ovato-lanceolatum, &c.*, (which, when occurring singly, are rendered into english by a mere change of termination), I have retained the latin termination of the former term; preferring *cordato-sagittate* and *ovato-lanceolate* to *cordate-sagittate* and *ovate-lanceolate*; because they have a much better effect, when addressed to the ear; and because a similar practice has obtained in compounding words in the other sciences: for example, *plano-convex* and *plano-conical* are employed, in preference to *flat-convex*, and *flat-conical*, and, indeed, are become perfectly naturalized, as they are admitted by Johnson to a place in his Dictionary.—It is hardly necessary to assign my reasons for preferring the terms *cordate, sagittate, ovate, &c.*, to either *hearted, arrowed, egged*; or to *heart-shaped, arrow-shaped, egg-shaped*, since the latter terms are neither recommended by equivalence, nor similarity to the original ones.

Upon the whole the Terms, I have employed, will be found to differ but little from those, recommended by Professor Martyn, to whom we are under considerable obligations for the pains he has taken in improving our native botanical language, as well as for other valuable works; and I must refer the reader to his Letter, in the first volume of the Linnean Transactions, and to the Preface to his Botanical Dictionary, for some excellent observations on the best mode of forming an english botanical language.

No Science is so dependent on the power of Arrangement as Natural History; nor any branch of Natural History, perhaps, so much as Botany. "Ergo si ullibi pura methodus e re est, sane

ic, si Vegetabilium claram ideam obtinere sperabimus." Accordingly many methods have been invented, of most of which an outline is given in this Volume (Dict. 1st. Art. Method). Several of these arrangements are very ingenious, and do great honour to their respective inventors: But all of them are, both in theory and practice, much inferior to the Sexual System of Linnæus, which directs us, with the greatest ease and certainty, to the discovery of the Class, Order, Genus, Species, and Variety of every Plant; to its Synonyms; to the Authors who have treated of it; and to the knowledge of its uses, and every other circumstance relative to it. This system, although extremely artificial, being found admirably adapted to the purpose of examining plants, was almost universally adopted without any alteration, till Professor Thunberg, regarding four of the classes, viz. *Gynandria*, *Monoecia*, *Dioecia*, and *Polygamia*, as not only superfluous and useless, but as uncertain and spurious, totally abolished them, in his *Flora Japonica*, published in 1784, and transferred the genera, formerly arranged under them, to those Classes and Orders, with which they agree in the number and connection of their stamens and pistils. The sexual system, thus altered, has met with the approbation of several eminent botanists, and has not only been adopted, by different writers, in the Floras of their respective nations or districts; but has even been extended to the great botanical works of Linnæus; to the *Genera Plantarum* by Haenke; to the *Systema Vegetabilium* by Gmelin; and, as I am informed, to the *Species Plantarum* now publishing by Willdenow.

Not contented, however, with the reformation of the system by Thunberg, Gmelin has been induced to proceed still further, and to exclude the Class *Icosandria*, and the Order *Monogamia* of the Class *Syngenesia*. Withering and Sibthorp have followed the example of Gmelin, in omitting the Order *Monogamia*, but have very properly retained the Class *Icosandria*. Dr. Thornton has announced his intention of giving a translation of the *Genera*

Plantarum of Linnæus, in which the classes will be reduced to one half of their original number. And it does not seem improbable, that some future reformer, dissatisfied with the inconstancy of the number of stamens, may venture to make a still further reduction of the number of the Classes. Perhaps, by some botanists it may be thought, that two classes are preferable to a greater number, one of which may comprehend all the plants with evident sexual organs, and the other those plants, that have no conspicuous sexual organs. To the former of these classes the new name of *Phanerogamia* might be given, and for the latter the old title of *Cryptogamia* might be retained. The Orders might be taken from the number, &c., of the stamens; the Sections from the number of the pistils; and the Subdivisions from the other parts of the fructification.

To some of the classes, abolished by Thunberg, objections were raised during the life of Linnæus, but he has strongly insisted upon the propriety, and necessity of retaining them, in the introduction to the class *Monoecia*: "*Methodus sexualis seorsim tradit sexu distinctos flores, ut omnes modos habeat generationis plantarum; qui non destituuntur usu in earum cultura. Si itaque sexu distinctarum classium Genera præcedentibus immixta fuissent, claudicaret methodus; defecisset usus, & in Scyllam incidisset evitaturus Charybdin, combinaturus Coniferos & Tricoccos cum Monadelphis, Cucurbitaceos cum Syngenesistis & in bivio stetisset ambiguus ad Nyssam, Gleditsiam, Mimosam, &c. ob diversum numerum staminum in sexu distinctis floribus.*" *Gen. Plant. ed. 6. P. 473.*—And two botanists of our own Island, Dr. Smith and Prof. Martyn, whose authority is deservedly high, have expressed their disapprobation of the reform.

In my arrangement of the British Genera, both in this work and the British Flora, I have adhered strictly to the Sexual System, as constructed by its illustrious author, for various reasons, which I shall now assign.

1. A method, which has contributed so much to the extension of Botanical knowledge as the Linnean System; which has been so long and so generally established, is so correct and beautiful in theory, so admirably adapted to practice, and in conformity to which so many valuable works have been published by different writers, ought not, in my opinion, to undergo a change in its fundamental parts without very cogent reasons, lest the advantages, expected from the innovation, should be more than counterbalanced by the confusion, necessarily introduced by it into the Science.

2. I much doubt whether the Linnean system can be improved in its outline or classes; and am of opinion, that neither the reduction of the number of the classes by Prof. Thunberg, nor any subsequent innovation has rendered it either more correct in theory, or better adapted to the purposes of investigation.

3. The four classes, *Gynandria*, *Monoecia*, *Dioecia*, and *Polygamia*, are founded on true principles, though liable to particular exceptions in common with all the other classes.

4. I am of opinion that, in many instances, the investigation of plants is rendered more difficult by the abolition of the above four classes. And that, in those instances, where the investigation is facilitated, by the incorporation of these classes with the others, the same practical advantages may be gained, without disturbing the Linnean Classification, by printing, in Italics, the names of the gynandrous, monoicous, dioicous, and polygamous genera in the Synoptical Table, placed at the head of each class, to which, according to the reformed system, they would belong.—I have adopted this plan (which unites the advantages of both modes of classification) in the British Flora, for the convenience of those botanists, who may have a predilection for the Thunbergian system, or who may have learnt to investigate plants according to it.

5. The names and characters of the Linnean Classes, though twenty-four in number, are so soon learnt, and so easily remembered, that a reduction of their number is not necessary merely on this account.

6. The abolition of the four classes, above mentioned, has not materially simplified the arrangement of the genera, since the number of subdivisions of the orders in the remaining classes has been augmented nearly in the same proportion, as the original classes and orders have been diminished: thus, Gmelin, in addition to those given by Linnæus, has admitted into the synoptical table of the Class Diandria, Order Monogynia, four sections or subdivisions, containing the gynandrous, monoicous, dioicous, and polygamous plants, and Dr. Withering has followed his example. This circumstance, at the same time that it shews the orders, in the Thunbergian System, to be much more extensive and complicated, is a tacit acknowledgment, on the part of the above authors at least, of the propriety of the principles, upon which the abolished classes are founded. For, if there be no genera, which have their stamens inserted in the pistils; which have male and female flowers on the same plant; which have male and female flowers on distinct plants; and which have male, female, and hermaphrodite flowers on the same or distinct plants; Why do they describe any genera as gynandrous, monoicous, dioicous, and polygamous? And why, as has just been observed, have they allotted to these genera distinct sections, or subdivisions? The characters of the other classes and orders are taken from circumstances, appertaining to the stamens and pistils, Why then should the uniformity of the outline be so far broken into, as to make these circumstances only the bases of sections or subdivisions of orders? And

7. The Thunbergian arrangement is less natural than the Linnean.

As the reasons, urged by Professor Thunberg, for abolishing

the four classes in question, have never, I believe, been given in any english publication, at full length, and as the reader may be much gratified by the perusal of them, I am induced to insert them in this place, and to enter into a particular consideration of their validity.

“ 1. Those plants are properly named *Gynandrous*, which have their filaments inserted in the pistil, or, rather, in the style. But in the whole of this class, when more accurately examined, scarcely any except the *Orchideæ* are gynandrous, if even these deserve to be so named, which have the parts of the pistil so indistinct, that scarcely any thing can be determined, respecting the style and stigma. Nothing, however, prohibits this family, which is furnished with two anthers, from being referred to the class Diandria. *Aristolochia*, indeed, seems to be truly gynandrous, but may conveniently, and with greater propriety be removed to Hexandria. The two filaments of *Gunnera* are inserted in the sides of the two-toothed germen, on the outside of the teeth, not in the style; this genus, therefore, ought, on every account, to be enumerated amongst the Diandrous plants. *Sisyrinchium* and *Ferraria*, both of which I have often examined in the living state, have three filaments coalesced into a cylinder, which includes the style, but is perfectly distinct from it, so that there can be no doubt but they belong to the other *Ensateæ*, referred to the class Triandria, or, if it be more agreeable, to Monadelphia. Linnæus, therefore, has rightly observed, in the Supplement to his System, that the filaments in *Ferraria pavonia* sheath the style. *Salacia*, *Stilago*, and *Nepenthes* have either their filaments, or their sessile anthers inserted in the germen. In *Ayenia* the filaments sit upon the margin of the nectary; and in *Gluta* and *Passiflora* the filaments may, with more propriety, be said to be fixed in a singular nectary than in the pistil. In *Kleinhovia* the stamens are within the nectary. *Pistia* and *Zostera* are so far from being gynandrous, that the filaments are removed to some

distance from the pistil in the flower, which is of a particular structure, or naked. *Grewia* and *Xylopia* have their stamens inserted in the base of the germen, and are so truly polyandrous, that it seems wonderful they should have been separated from the 13th class. Indeed Linnæus has justly observed, in the Supplement to his System, that the genus *Grewia* would be more properly placed in Polyandria. The genera, belonging to the natural order of Piperitæ, viz. *Arum*, *Dracontium*, *Calla*, &c., bear their stamens on an elongated receptacle, either separate from the stigmas, or intermixed with them, but never sitting upon them. In neither of these cases can a certain number of stamens be assigned to each flower, but they are very numerous and scattered. They might, therefore, be more properly referred to Monoecia, and most properly to Polyandria, for the same reasons as *Annona*, *Michelia*, *Gnetum*, and *Magnolia*.

" 2. I should have been willing to retain the classes *Monoecia* and *Dioecia*, either distinct, or combined under the name of *Diclinia*, if it would not have been repugnant to nature, and have created numerous difficulties in the investigation of plants: *Cynomorium*, *Rhodiola*, *Myriophyllum verticillatum*, *Coriaria*, *Menispermum* frequently bear hermaphrodite flowers, and therefore according to the method, received by Linnæus, ought to have been referred to Polygamia. Of the two species of *Callitriche* one is monoicous, the other hermaphrodite. *Ruscus racemosus* is also furnished with hermaphrodite flowers. *Urtica* is both monoicous and dioicous. *Populus*, indeed, generally bears dioicous flowers, but I have sometimes observed them to be monoicous. In the *Cliffortia* I have not uncommonly found dioicous flowers, and frequently monoicous flowers. Among the dioicous species of the *Salices*, there are two, which have hermaphrodite flowers. Amongst the *Mercuriales*, one species, viz. *ambigua*, is monoicous. *Spina-cia oleracea*, in our gardens, is most frequently found to be dioicous, yet I have often seen it both monoicous and hermaphrodite. *Clusia pulchella* is often dioicous, however it is not un-

commonly also monoicous. In its native soil *Rhodiola* is commonly found dioicous, and a female plant, kept without a male, in the Academic Garden at Upsal; continued such more than fifty years, when, a male being introduced, it produced yearly hermaphrodite flowers. From the instances adduced it is sufficiently evident, that monoicous and dioicous flowers vary very much, and are not always constant; besides, in many male flowers the rudiment of a pistil is likewise present, as in *Euclea*, *Hydrocharis*, *Iatropha*, &c. If then these classes be retained, great confusion will arise, nor will there ever be any certainty in examining those plants, which either occasionally produce hermaphrodite flowers, i. e. which are sometimes polygamous; or which vary from soil and climate, so much as to bear dioicous and androgynous flowers. On the contrary, there will be no difficulty in referring to the hermaphrodite classes a plant with a male flower, and to the order the same species with a female flower, whether it be monoicous, or dioicous, or even polygamous.

“ 3. The class *Polygamia*, if the two preceding should be retained, ought to be entirely abolished, since it is perfectly useless, and occasions very great confusion in investigating plants. There are many plants, not even referred to this class, which have polygamous flowers, as almost all the *Umbellatæ*, a very great part of the *Syngenesiæ*, and various other genera, as *Rhamnus*, *Diosma*, *Ilæx*, *Æsculus*, *Laurus*, &c. In reducing plants to this class, it is necessary that there be a hermaphrodite flower, and, this being found, it is easy to refer the plant to another class, according to the number of stamens. If a male or female flower be found separately, we are still ignorant whether the plant belongs to *Monoecia*, *Dioecia*, or *Polygamia*; the other sex must necessarily be sought, and if we find it on the same plant, we believe it to be Monoicous, if on a distinct plant, we guess it to be Dioicous; but, before we can be certain, we must seek, through the whole world, for hermaphrodite flowers, and if any should occur, these would require it to be referred to *Polygamia*. This difficulty

occurs too in examining accurately all vegetables. For when I have found an hermaphrodite plant of any class whatever, I dare not refer it, with confidence, to the first classes of the system, according to the number of the filaments, for fear lest the same plant, growing in another situation, should bear monoicous or dioicous flowers. The method of investigating plants, therefore, is rendered far more secure and easy by the abolition of this class. For if the hermaphrodite plant occur at first, it may be referred, according to the number of its stamens, to that class, in which other plants, with the same number of stamens, are placed. If the male plant occur, we can immediately determine the class from the number of filaments, and the other sex will only require to be investigated, that the order may be determined. If we examine the polygamous plants with more attention, we shall very often find, that those flowers, which have been said to be only of one sex, are not so completely destitute of either the male or female parts, as is commonly supposed. For the rudiment of the stamens is frequently present, and the rudiment of the pistil, almost always : for example, in *Musa*, which is truly hexandrous, there are always six anther-bearing filaments, although five of the anthers are barren. In *Valantia*, *Veratrum*, *Acer*, *Diospyros*, *Gouania*, *Begonia*, *Fraxinus*, *Pisonia*, there are always pistils, some of which are abortive, as sometimes happens in *Prunus cerasus*, and many others. In examining more than a thousand individuals, belonging to the genus *Anthospermum*, I have never been able to find hermaphrodite flowers ; they have constantly been dioicous.

“ Therefore, in these four superfluous classes, *Centella*, *Solandra*, and *Mercurialis afra* have been improperly separated from *Hydrocotyle*.† *Hermas* from *Bupleurum*, *Panax* and *Arctopus* from

† *Centella villosa* (of which *Mercurialis afra* is a synonym), & *glabrata*, & *Solandra capensis*, are referred to *Hydrocotyle*, in the 14th Edition of the *Systema Vegetabilium* by Murray.

the Umbellatæ, *Atriplex* from *Chenopodium*, the Gramina from the Triandrous genera, *Veratrum* from *Melanthium*, &c.

“ I have inserted the *Palmae* in their proper classes, from which, both in the last edition of the System and in the Supplement, they have, for I know not what reason, been excluded till this day.” *Flora Japonica*. p. 19—24.

What this celebrated author has advanced, respecting *Gynandria*, does not, in my opinion, establish the propriety of abolishing the class. He does not deny that *Aristolochia* and the *Orchideæ* (which constitute a perfectly natural order, containing more than ten genera) are gynandrous. To these may be added, on the excellent authority of Schreber, *Gunnera*, *Salacia*, *Rhopium*, and *Cytinus*. And most of the *Orchideæ* are considered by Schreber as monandrous, the parts, that are named anthers, being more properly two receptacles of the pollen. If *Ferraria* and the remaining genera, objected to by Thunberg, be admitted to belong to the other classes, this will only prove that the number of genera, referred to the class *Gynandria*, ought to be diminished; not that the class should be totally excluded. Linnæus was well aware that *Calla*, *Arum*, *Dracontium*, *Pothos*, and *Zostera* might, with propriety, be transferred to some of the other classes, but was induced to retain them in *Gynandria*, from the difficulty of determining a more proper place for them. And succeeding botanists are, by no means, agreed as to the class, in which some of them should be placed; thus, for example, Thunberg has arranged *Zostera*, *Arum*, and *Dracontium* in *Polyandria*: Schreber has referred *Zostera* and *Arum* to *Monoecia*, and *Dracontium* to *Heptandria*: Gmelin has transferred *Zostera* and *Arum* to *Polyandria*, and *Dracontium* to *Heptandria*: and Dr. Smith has placed *Zostera* in *Monandria*. Whilst this diversity of opinion obtains, respecting the classes, under which these genera ought be arranged, I have chosen to let them remain in *Gynandria*, where they were placed

by Linnæus, and to insert their names, in *Italics*, in the different classes, to which they have been removed by later authors.

If, as Professor Thunberg has asserted, it be repugnant to nature to retain the classes *Monoecia*, and *Dioecia*; or if, by retaining them, the difficulty of examining plants should be materially and invariably increased; these would, undoubtedly, be strong reasons for abolishing them. But is this the case?

1. That it is not repugnant to nature to retain these two classes, is completely evinced from this circumstance, that, in some of the genera, hermaphrodite flowers are never produced. The male and female flowers are constantly distinct, and must necessarily remain so, because their structure is different, as in *Quercus*, *Corylus*, &c. These genera, indeed, are not very numerous; but, if this be sufficient to justify the abolition of the classes under consideration, with equal reason might the classes *Heptandria* and *Enneandria*, as they contain but few genera, be excluded.—It is true that some genera, referred to the class *Dioecia* are occasionally monoicous, and sometimes produce hermaphrodite flowers. But do not many genera, arranged in those classes, which are founded on the number of the stamens, occasionally vary in the number of their male organs? It is also true that some genera, referred by Linnæus to the class *Monoecia*, contain species, that are very constantly dioicous, as *Urtica*, *Carex*, &c. But do not exceptions of a similar nature occur in the first ten classes? Do not, for example, *Polygonum* and *Vaccinium*, which are arranged in the class *Octandria*, contain species, constantly different in the number of their stamens, from the rest of their congeners? Is not *Vaccinium Myrtillus* decandrous, *Polygonum amphibium* pentandrous, and *Polygonum Persicaria* hexandrous? Do not the different species of *Polygonum* also vary in the number of their pistils as well as their stamens? Yet this inconstancy in some of the genera is not considered as a sufficient ground for abolishing the class *Octandria*. Neither should a few irregularities

or exceptions, occurring in the classes Monoecia and Dioecia, make us consider it as repugnant to nature to retain them, or induce us to exclude them as superfluous, uncertain, and spurious. If every class ought to be abolished, in which some of the species occasionally, or even invariably depart from the classic character, what class would be able to maintain its ground? Besides, the reformists have described and arranged many genera, as monoicous, and dioicous.

2. That the investigation of plants, in several instances, is not rendered more difficult by retaining the classes Monoecia and Dioecia, will appear evident from the following examples of british plants. According to the Linnean arrangement, a plant belonging to the genus *Sparganium*, in consequence of the male and female flowers being placed, in distinct heads, upon the same plant, would, without any difficulty, be referred to the class Monoecia; and, the class being determined, the student would not afterwards experience much trouble in discovering the genus, even though he should not at first be able to satisfy himself perfectly as to the number of stamens; and consequently would not be able to determine the order satisfactorily from thence. But, in examining the plant by the reformed system, unless the student be able to ascertain the number of stamens in the male flowers, he can not determine to what class it belongs; and, therefore, can not proceed in the investigation. As a proof how difficult it is to separate the male florets from each other, and ascertain the number of stamens in this genus with exactness, it is only necessary to say that Linnaeus himself has referred it to the order Polyandria in his *Flora Lapponica*. The same may be said of plants, belonging to the genus *Typha*, for in these it is extremely difficult to determine accurately the number of the stamens, and it would therefore occasion a great deal of trouble to a botanical student to ascertain the class, to which it is referred in the reformed system; but, in the Linnean Arrangement, the appearance of staminiferous and pistilliferous flowers, disposed in distinct cylindrical spikes or

aments upon the same individual plant, would lead him immediately to a knowledge of the class, and the investigation might be proceeded in, even though he should not be able to satisfy himself perfectly concerning the order. In these instances the investigation will be rendered more perplexing to the student, according to the reformed, than the Linnean system, on account of the difficulty of determining the number of the stamens. The uncertainty of the number of the stamens and pistils in the two classes, Monoecia and Dioecia, also adds much to the difficulty of examining monoicous and dioicous plants, according to the Thunbergian system. For it may be remarked as a general rule, with regard to these classes, that the number of the sexual organs is less constant, than in the hermaphrodite classes, which furnishes an additional reason for retaining them. Thus in *Quercus*, for example, the stamens are found to vary in number from five to ten, but are generally more than seven. Now this circumstance creates scarcely any difficulty in the Linnean Arrangement, because the flowers are soon discovered to be of different sexes upon the same plant, whence we are induced to refer it to Monoecia, and because the number of the stamens points it out as belonging to the order of Polyandria, to which are referred all those genera, that have more than seven stamens. Whereas it is very difficult to determine, in which class of the reformed system this genus should be placed: And we accordingly find it differently arranged by those botanical writers, who have adopted it. Thunberg, Haenke, and Sibthorp, have placed it in the class Enneandria; Gmelin and Withering, have removed it to Octandria. They also differ respecting the number of the pistils in this genus, the three former authors making it monogynous, and the two latter considering it as tetragynous. Gmelin has given it nineteen, and Withering eleven different places in their synoptical tables of the genera, in all which it might be sought for by the botanical student, with propriety, owing to the inconstancy of the number of its stamens and pistils. The same observations apply to *Carpinus* and *Fagus*, the former of which is placed by Haenke in

Decandria, and in Dodecandria by Gmelin and Withering; the latter is referred to Dodecandria Digynia by Haenke, to Dodecandria Trigynia by Thunberg, Gmelin, and Withering.

If, in the investigation of plants belonging to the class Dioecia, only one plant, the male for ex. should be found; on examining the flowers, and discovering that there are no pistils or female organs, the student will without much trouble, according to the Linnean method, refer it to the class Dioecia, and the number or connection of the stamens will enable him to determine the right order, and by that means he may be enabled to determine the genus even before he has met with the female plant: For the small number of plants, belonging to each of the orders in this class, would encourage him to proceed in his examination. But the investigation of a dioicous plant would not be equally practicable according to the reformed system: For, though from the number or connection of the stamens he might be enabled to ascertain the class, he could not determine the order till he had met with the female plant: and, if the class should be very comprehensive, to which it is found to belong, he would, in all probability, be deterred from proceeding any further, till, on finding the female, he had derived further assistance. Suppose, for example, a student should meet with a male plant of the species *Humulus Lupulus*; if he were to investigate this, according to the Linnean System, he would be able to determine the class, order, and even the genus and species without much difficulty: But, after ascertaining the class to be Pentandria, he would not be able to determine the order, according to the Thunbergian System: And, as the Class Pentandria is very extensive, it is not likely, that he would undertake to investigate the genus, till he should have met with a female plant. And, if both male and female plants should be found at the same time, the investigation would be equally, if not more, easy, according to the method of Linnæus. And in every instance, wherein the investigation is

facilitated by the abolition of these classes, the same advantage may be gained by the expedient, to which I have had recourse, without interfering with the original classification.

Again, if it be admitted that some genera, referred to the class Polygamia by Linnæus, may, with equal or greater propriety, be removed to the other classes; and, that several genera, belonging to the natural orders of Umbellatæ and Compositæ, arranged by him under the 5th and 13th classes (on account of the male or female, and hermaphrodite flowers being on the same receptacle, or contained within the same calyx), might very properly have been placed in Polygamia; these objections only prove that Linnæus has committed an error in arranging some of his genera: They by no means establish, in my opinion at least, the propriety or necessity of abolishing this class. And, though some hermaphrodite, monoicous, and dioicous plants may occasionally be observed to bear polygamous flowers, there is nevertheless a good foundation for the class: For we have some truly polygamous genera, in which the flowers of the different species must remain distinct as to their sex, the hermaphrodite flowers being different in their structure from the others, as in *Atriplex* and *Gleditschia*. We have other genera, in which the hermaphrodite and male flowers invariably differ in the number of their stamens; as in *Ophioxylum*, *Chloris*, *Nyssa*, &c. In *Nyssa* the male flowers have ten, and the hermaphrodites only half this number of stamens.—In *Breyeria* the hermaphrodite flower is monogynous, and the female pentagynous. In some genera the stamens are inconstant in their number, both in the hermaphrodite and male flowers: e. g. in *Mimosa* the stamens vary from 4 to 100, and in some species they are distinct, in others connate; whence it is extremely difficult to determine the class, to which this genus should be transferred in the Thunbergian system. Thunberg, indeed, and Gmelin have referred it to Polyandria. To the above reasons, for retaining the class in question, it may be added that Gmelin, Withering, &c, who have adopted the reformed system, have described many of

the genera as polygamous, and have even, in some instances, placed them in a distinct section. Nor does that confusion arise in the examination of plants, from the Class Polygamia being retained, which Professor Thunberg has represented. More difficulty will, in general, be experienced from the investigation of polygamous than hermaphrodite plants, whichever method we follow; and I am not certain that the difficulty will, in any case, be materially lessened by investigating according to the system, as altered by Thunberg. If an individual plant should occur, bearing male and hermaphrodite flowers, as a *Parietaria*, *Acer*, &c, or female and hermaphrodite flowers, as an *Atriplex*, or male, female, and hermaphrodite flowers, as an *Apluda*, the class, order, and genus would be as easily determined according to the Linnean, as the Thunbergian system. If an hermaphrodite individual of a polygamous species, as *Fraxinus excelsior* for example, should occur singly, a botanist, investigating according to the system of Linnaeus, would first look for it in the class Diandria Order Monogynia, to which, from the number of the stamens, it would appear to belong, and, not finding any generic character, with which it corresponds, he would, in the next place, look for it in the Order Dioecia of the class Polygamia, and he would not find much difficulty, or trouble in determining the genus, as there are only ten genera referred to this order in the *Systema Vegetabilium* by Murray, and only one in the Floras of this nation. And a botanist, who should examine the same plant according to the reformed system, would first compare it with the generic characters of the hermaphrodite plants, contained in Diandria Monogynia; and, finding it not to correspond with any of these, he would next be led to examine the subdivisions of the order, which comprehends the polygamous flowers, nor would the difficulty be materially lessened by this mode of arrangement.—If the female individual of any polygamous plant were to occur singly, the investigation could not very well be proceeded in according to either system. But, a person investigating by the Linnean method, would be pretty certain that it belonged either to the Class Dioecia,

or *Polygamia*; whilst another person, accustomed to examine plants according to Thunberg's method, could not possibly tell to what class it should be referred.—If the male individual of a polygamous genus, as *Nyssa* for example, were to occur singly, a student, investigating according to the original sexual system, would, in all probability, first examine the order Decandria of the Class Dioecia, and, not finding it there, would next examine the Order Dioecia of the Class Polygamia, where he would be enabled to determine the genus. Another student, investigating the same plant according to the reformed sexual system, would, from the ten stamens, be induced to look for it in the Class Decandria; but, there being no circumstance to direct him to the order, he would either proceed no further, or, if he possessed sufficient patience and perseverance, he would be led to compare it with the different generic characters, comprehended in the whole of the class, and, finding none with which it corresponded, he might next be led to compare it with the characters of the genera, inserted in Italics in each of the orders; and, if he should be able to ascertain the genus, he would find that it agreed with *Nyssa*, which, in the reformed system, is referred to Pentandria, because the hermaphrodite flowers have only half as many stamens as the male flowers; But the difficulty experienced in examining this plant, according to the reformed system, would be much greater.

To conclude, after a careful consideration of the objections, raised by Professor Thunberg, against the four classes, *Gynandria*, *Monoecia*, *Dioecia*, and *Polygamia*, I am of opinion, that they are founded upon true principles, and only liable to particular exceptions in common with all the other classes; and that the abolition of them will, by the confusion it has introduced into botanical writings, rather retard than promote the extension of the Science:

*** Since the Preface was printed, I have met with the 1st. and 2d. parts of Willdenow's Edition of the *Species Plantarum*, and find, that he adheres to the Linnean Arrangement in this work, although he has adopted the reformed system of Thunberg, in his *Floræ Berolinensis Prodrömus*. See Preface p. 17. l. 26.

This Observation to be placed after the Corrections and Additions in Vol. I.

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PAGE

ii.

vi.

xxvii.

xl.

CONTENTS.

VOLUME I.

	PAGE.
Introduction to the Sexual System of Linnæus	i.
Ch. 1. Of the Parts of a Plant	vi.
— 3. Of the Divisions of the Linnean System, and the Method of investigating Plants	xvi.
— 3. Of the Formation of an Herbarium	lii.
Botanical Terms and Definitions employed by Linnæus	1.
Terms and Definitions, used by Hedwig, in his Characters and Descriptions of the Frondose Mosses	64.
Terms and Definitions, employed by Linnæus, and other writers, in their Descriptions of the Funguses	83.
Carpological Terms and Definitions, employed by Gærtner	92.
An English-Latin Dictionary of Botanical Terms	201.
A Latin-English Dictionary of Botanical Terms	269.
Explanation of the Plates	293.

VOLUME II.

The Essential and Natural Characters of the Genera of British Plants, as given by Linnæus, Gærtner, &c.	1.
Persoon's Arrangement and Characters of the Fungi	288.
An Account of the Natural Orders of Plants	296.
Explanation of the Plates	396.

CORRECTIONS & ADDITIONS

IN VOLUME I.

In the Introduction.

PAGE.	LINE.
ii.	36. After low add in the animal world.
vi.	last but one. After than insert as.
xxvii.	22. and in the note. Before <i>Hippocastanum</i> insert <i>Æsculus</i> .
xl.	13. After order add, except three foreign genera, <i>Panax</i> , <i>Arctopus</i> , & <i>Hermas</i> , which are referred to Polygamia.

In the Botanical Terms, &c.

5.	23. For Fastigate read Fastigiate.
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PAGE. LINE.

15. 22. For ~~Tregeminate~~, ~~trigeminitum~~, read Tergeminate, *ter-*
geminum.
18. 11. For (534) read (543).
21. 32. For (393) read (388).
26. 10. After See add Pl. VI. f. 6.* *a.* and.
24. For Vol. II. Pl. I. Div. 3, read Pl. VI. f. 6.* *b.*
27. 19. For f. 4. *a.* read f. 8. *a.*
30. 19. For (58) read (586).
35. 41. For 701—712 read (738—740).
48. 26 & 28. For Pl. VI. read Pl. VIII.
44. 32. For Pl. VIII. read Pl. VII.
48. 34. For (587) read (606).
66. 19. For (938) read resembling network.
83. 18. For (6) read (15); and in line 19, for (5) read (6).
87. 6. Read Somewhat straw-coloured, *substramineus*.
88. 5. For *Lamina* read *Lamella*; in line 14, for 17. *a.* read
17. *b.*; in line 28, for X read XI; and in line last,
for 17. *b.* read 17. *f.*
99. 30. For with, many read with in many.
105. 30. Strike out and.
118. 14. After there add is.
192. 35. Before CENTRIPETAL add RADICLE.
219. 2. For livid colour read lurid appearance.

IN VOLUME II.

29. 41. For involute read enwrapped.
73. 6. After Florets insert almost.
127. 28. Strike out three.
138. 37. For *Under* read *Upper*.
166. 10. Add SEEDS roundish.
182. 29. In this and a few succeeding genera for *Anthers* read
Antker.
192. 28. For unequal read equal.
214. 36. For innermost read undermost.
241. 37. Add COR. as in the male.
242. 39. For *Male* read *Female*.
283. 33. Add I. Cupbearing.
299. 8. For Holm read Stockholm.
303. 2. For publications the Introduction read publication the
Introductions.
401. 8. For pistil read petal.
404. 13. For *POTENTILLA* read *POLYGYNIA*.

INTRODUCTION

INTRODUCTION

TO THE

LINNEAN SYSTEM

OF

BOTANY.

PAGE. LINE.

15. 11. For *Trigonometria*, *Logarithmica*, and *Peripatetica*, read *Trigonometria*.
16. 12. For (544) read (543).
17. 13. For (543) read (542).
18. 14. After *sermo* PL VI. 1. 8. 2. add *et*.
19. 15. For *PL. VI. 1. 8. 2.* read *PL. VI. 1. 8. 2. 4.*
20. 16. For *PL. VI. 1. 8. 2.* read *PL. VI. 1. 8. 2. 4.*
21. 17. For *PL. VI. 1. 8. 2.* read *PL. VI. 1. 8. 2. 4.*
22. 18. For *PL. VI. 1. 8. 2.* read *PL. VI. 1. 8. 2. 4.*

INTRODUCTION

TO THE

LINNEAN SYSTEM

OF

BOTANY.



AN

INTRODUCTION

to the

LINNEAN SYSTEM

of

BOTANY.



BOTANY, taken in its most extensive signification, is that branch of Natural History, which treats of Vegetables, and includes not only the knowledge of them, but the consideration of every circumstance, relative to them, as their structure, functions, properties, uses, &c.; in its most limited, and usual acceptation, it is the Science, which teaches us to distinguish Vegetables from each other, by arranging them methodically, and assigning to each its appropriate character and name.

All organized and living bodies, which are destitute of sensation, and spontaneous motion, which adhere to some other body, in such a manner as to derive their nourishment from thence, and are endowed with the power of propagating their species by seeds, are named Vegetables, or Plants.*

* Although the propriety of referring the productions of Nature to the three grand divisions, named the Animal, Vegetable, and Fossil or Mineral Kingdoms, be universally admitted, it is found difficult, and is by many very respectable writers deemed impossible, in consequence of the near approaches, which they make to each other at their extremes, to assign to each its proper limits, and to give such definitions as will be found applicable in every instance. The following definitions, given by Linnæus (*Systema Naturæ* ed. 13. p. 4.) are, perhaps, as correct as can be produced.

“ Fossils are *concrete* bodies, neither alive, nor sentient.

VEGETABLES are *organized*, and *living* bodies, but not sentient.

The SUBSTANCE, of which Vegetables or Plants, at least the more perfect ones, are composed, appears under the forms of *Cuticle, Outer Bark, Inner Bark, Alburnum, Wood, and Pith.*

The CUTICLE (*epidermis*) is the thin, dry, porous membrane, constituting the outermost integument, or covering of the plant.

The OUTER BARK (*cortex*) is the intermediate integument. It is of a laminated structure, dry, hard, and frequently cracked, or chinky.

The INNER BARK (*liber*), which is the inmost integument, is membranous, juicy, and flexible. These three integuments are, in common language, comprehended by the term *Bark*.

The ALBURNUM is the soft substance, placed betwixt the wood, and the inner bark, and is nothing more than newly formed, or imperfect wood, which has not acquired the proper degree of hardness. It is most conspicuous in the Trunks of trees, which have very hard wood, as in *Oak*, or *Ebony*, and is named *Sap* by workmen.

The WOOD (*lignum*) consists of numerous, hard, and compact concentric plates, each of which is supposed to have been successively formed from the inner bark of the preceding year.

The PITH OR MARROW (*medulla*) is the cellular, or vesicular substance, occupying the centre, or axis of the wood. It is found to be much more abundant in young plants, than in those that are further advanced, and is in much greater quantity in some trees, as *Elder*, than in others.

Each of these parts, except perhaps the cuticle, appears to be formed of numerous vessels*, containing fluids of different kinds, and cellular texture, which, when less compact and more succulent, is named pulp, or *parenchyma*.

ANIMALS are *organized, living and sentient bodies, which move spontaneously.* And he adds, that their limits concur in the *Zoophytes*.

Since in true Fossils, or Minerals there are no vestiges of organization or life, no vessels, no propulsion of fluids, no irritability, no periods of birth, growth, perfection, decline, and death, the line of distinction betwixt them and Vegetables, or Animals, is more clearly ascertained than between the two latter: For Nature has descended so extremely low, from the most complicated, or, as they are more commonly termed, perfect animals to the most simple, or imperfect, that it will be almost, if not equally as difficult to prove, that some of these possess the powers of sensation and voluntary motion, as that vegetables are destitute of them: And, if it be admitted that these faculties are not exclusively possessed by animals, it does not seem possible, on account of the numerous analogies, subsisting betwixt them and vegetables, to give any perfectly discriminative characters, taken either from their anatomical structure, functions, or chemical analysis.

* For a further account of the vessels, and their contents, see the Dictionary.

It is indispensably necessary to the successful cultivation of those sciences, which comprehend an immense number of objects, possessing universal and common, as well as peculiar and characteristic marks, to adopt a clear and well founded method or arrangement, and to employ precise and significant terms. In both these respects Botany stands unrivalled. It possesses in the Linnean, or Sexual System an arrangement, which, though not absolutely unexceptionable, approaches very near to perfection, and a language, which is a model of precision and conciseness.

According to this System Plants are referred to Classes, Orders, Genera, Species, and Varieties. The Classes are the primary divisions, and are composed of Orders; the Orders are the secondary divisions, and are composed of Genera; the Genera of Species; the Species of Varieties, and the Varieties of Individuals.

In order to convey a more clear idea of the relation of these divisions and subdivisions to each other, it is usual to compare them with the divisions of a Kingdom, or an Army, which are more familiar to us: For example, if we form a comparison between the **VEGETABLE KINGDOM**, and the **KINGDOM OF ENGLAND**,

The **CLASSES** may be compared to the **PROVINCES**.

The **ORDERS** to the **COUNTIES**.

The **GENERA** to the **HUNDREDS**.

The **SPECIES** to the **PARISHES**.

The **VARIETIES** to the **VILLAGES**.

The **INDIVIDUALS** to the **HOUSES**.

The characters of the three superior divisions are invariably taken from the Flower and Fruit, and those of the species, and varieties, are sometimes taken from the same source, but most commonly from the Leaves, or remaining parts of the Plant. But, before we enter further into the explanation of the System, it will be proper to exhibit an outline, or general view of the parts, of which a plant, considered botanically, is composed.

CHAPTER I.

OF THE PARTS OF A PLANT.

A PLANT is divided by Linnæus into three primary parts, namely, the *Root*, *Herb*, and *Fructification*.

The *ROOT* (*radix*) is the part, which produces the herb, and fructification, and by which the plant derives its principal supply of nourishment.* It is composed of pith, wood, outer bark, inner bark, and cuticle; and it consists of the *BODY* OR *MAIN ROOT* (*caudex*), and of *FIBRES* OR *RADICLES* (*radiculæ*). The latter constitute the essential part of the root, since the plant is nourished by them, and they are frequently present, when the main root is wanting. See Plate II. fig. 1.

Roots are generally concealed below the surface of the earth; but are sometimes inserted into the stems, &c. of other plants, and derive their food from thence, as the roots of *Misseltoe* and *Dodder*, which are, from this circumstance, named parasitical plants. *Duckmeat*, a small plant found floating on the surface of almost every ditch, and pond, furnishes an example of a plant, neither attached to the earth, nor any other solid body, its roots hanging perfectly loose in the water. Other vegetables, as *Lichens*, are attached to the surface of the hardest stones and rocks, and have very indistinct roots; whence it may be supposed, that these answer no other purpose than that of fixing them, and that their nutriment must be imbibed, or taken in, solely by vessels, opening upon their upper surface. Finally, in some plants, as the different species of *Tremella*, no vestiges of a root can be discovered.

Roots are distinguished from each other by their duration, figure, and direction; but, as it is extremely desirable in a science, which requires the knowledge of so many terms, as Botany, to introduce these, as gradually as possible, to the notice of the student, and to afford him an opportunity of making a practical application

* The nutritious matters, absorbed by the roots of vegetables, from the soils, in which they grow, are 1. Water. 2. Carbon, or Charcoal. 3. Earths, viz. *Lime*, *Silex*, *Argill*, and *Magnesia*. 4. Carbonic Acid Gas. 5. Salts, viz. *Sulphats of Potash*, *Soda*, and *Lime*, *Muriats of Potash*, and *Soda*, and *Phosphat of Lime*. Of these the neutral salts are supposed, from the smallness of their quantity, to serve rather as condiments than food. See Kirwan on *Manures*.

of those he has learned, before he proceeds to others, the particular consideration of the terms, applicable to roots, will be deferred, till we come to point out the method of investigating the species of plants.

The HERB is that part of a plant, which arises from the root, and is terminated by the fructification (flower and fruit). It comprehends the *Trunk*, *Leaves*, *Fulcres*, and *Hybernacle*.

I. The TRUNK (*truncus*) is defined to be the organ multiplying the plant, or which elevates the leaves, fulcres, and fructification. It is composed of pith, wood, alburnum, inner bark, outer bark, and cuticle, and is used as a generic term, including four species, viz. *Stem*, *Scape*, *Culm*, and *Stipe*.

1. A STEM (*caulis*) is a trunk, which supports both the leaves and fructification.
2. A SCAPE (*scapus*) is a trunk, elevating the fructification, but not the leaves. See Plate II. fig. 2.
3. A CULM (*culmus*) is the trunk peculiar to grasses. See Plate II. fig. 1.
4. A STIPE (*stipes*) is a trunk, which passes into leaves, or it is the base or trunk of a frond. See Plate II. fig. 3.

Trunks are distinguished according to their duration, direction, figure, and other circumstances, which, for the reason given above, will be more properly attended to hereafter.*

II. The LEAVES (*folia*) are considered as the organs of motion, and respiration. They appear to be chiefly composed of cuticle, bark, a lax cellular texture, or parenchymatous substance, and numerous vessels; and are considered by some writers as compressed stems. The leaves are very well adapted to answer the purposes of Lungs to the plant, since their expanded form affords sufficient room for the numerous vessels, opening on their surfaces, to imbibe air and moisture for the support of the plant; to receive the influence of heat, and light; and to exhale whatever is injurious or useless to it.†

They admit of various distinctions, from number, figure, situation, direction, &c. &c. which will be pointed out, previously to the consideration of the manner of investigating the species of plants.

III. The FULCRES (*fulcra*) are parts, intended for the sup-

* The Branches are the parts of the Trunk, and have various terms applied to them.

† Plants, by decomposing fixed air, or carbonic acid gas, and water, by retaining the carbon and hydrogen, and emitting a great part of the oxygen gas, or vital air, prevent the atmosphere from becoming unfit for the purposes of respiration, and combustion, and, in this way, perform an office of the greatest importance to the animal kingdom.

port and defence of the plant, and are of seven kinds, viz. *Petiole*, *Stipule*, *Tendrils*, *Pubescence*, *Arms*, *Bracte*, and *Peduncle*.

1. A **PETIOLE** (*petiolus*) is a fulcre, supporting a leaf only, and is, by some writers, named the *leaf-stalk*, or *foot-stalk*. See Plate III. fig. 4. *a*.
2. A **STIPULE** (*stipula*) is a scale, or leaf-like body, situated at the base of a petiole. See Plate III. fig. 5. *a*.
3. A **TENDRIL** (*cirrhus*) is a filiform, spiral band, by which a weak plant attaches itself to another body, for its support, as the *Vine*, *Pea*, &c. See Plate III. fig. 5. *b*.
4. **PUBESCENCE** (*pubes*) comprehends every kind of hairiness, or clothing, observable on plants. Various kinds are enumerated by Linnæus, as *Hairs*, *Wool*, *Beard*, &c. &c.
5. **ARMS** (*arma*) include *Prickles*, *Thorns*, and *Stings*, and serve for the defence of plants against the attacks of animals. See Plate III. fig. 6.
6. A **BRACTE** (*bractea*) is a kind of leaf, placed near a flower, which is considerably different from the other leaves in figure, and colour. Bractes are situated on the peduncle, and sometimes so near the flower, as to resemble a calyx at first view. The bracte, represented in Plate III. fig. 1. *f*., is not sufficiently distinguished from a floral leaf, by which is understood a leaf placed near a flower, but differing only slightly, in magnitude or figure, from the other leaves, and, therefore, not properly considered as a bracte. The *Lime* or *Linden Tree* furnishes a very excellent example of a bracte.
7. A **PEDUNCLE** (*pedunculus*) is a fulcre, appropriated to the support of the fructification, or flower and fruit, only. It is sometimes branched, or divided into pedicels, or partial peduncles.

The various modes, in which the flowers are joined to a plant, by means of their peduncles, are expressed by the generic term **INFLORESCENCE**, which includes *Spadix*, *Cyme*, *Umbel*, *Spike*, *Ament*, *Strobile*, *Corymb*, *Raceme*, *Panicle*, *Thyrse*, *Fascicle*, *Head*, *Verticil*, *Compound Flower*, and *Aggregate Flower*.

1. A **SPADIX** (*spadix*) is a receptacle, or peduncle, proceeding from a spathe or sheath, which opens longitudinally. It is either branched, as in *Palms* (Plate VI. fig. 6.); or simple, as in *Wake-robin* (*Arum*).
2. A **CYME** (*cyma*) is a receptacle from the same universal centre, elongated into fastigate peduncles, with the partial ones scattered.—It is composed of several peduncles of equal length, which arise, in a radiate form, from

a common centre, and are subdivided into several irregular, scattered pedicels, or partial peduncles, as in *Elder*. See Plate VII. fig. 11.

3. An **UMBEL** (*umbel*) is a receptacle from the same centre, elongated into proportionate filiform peduncles—Or it consists of a number of filiform peduncles of the same length, arising, like the spokes of a wheel, from the same common centre.

An universal umbel resembles a *Cyme*, but is much more regular; the pedicels, which form the partial umbel, or umbellet (*umbellula*), all arising from the same centre, and to an equal height. See Plate VII. fig. 5. The umbel is exemplified in *Carrot*, *Parsley*, *Hemlock*, &c.

4. A **SPIKE** (*spica*) is a species of inflorescence, wherein several sessile flowers are placed alternately, or in a scattered manner, on a common simple peduncle, as in *Wheat*, *Lavender*, &c. See Plate VII. fig. 1. The peduncle, or receptacle, is named a spike-stalk (*rachis*), in the *Grasses*.

5. An **AMENT** (*amentum*) is a kind of inflorescence, formed from a common, chaffy, gemmaceous receptacle; or which consists of several flowers, with chaffy scales, disposed along a filiform receptacle, or peduncle, as in *Hazel*, *Willow*, &c. See Plate VII. fig. 7.

6. A **STROBILE** (*strobilus*) is formed from an ament, the scales becoming indurated. See Plate VI. fig. 5. It is likewise enumerated by Linnæus amongst the species of *Pericarps*, and is exemplified in the *Pine*.

7. A **CORYMB** (*corymbus*) is formed from a spike, each flower being furnished with a proper peduncle, and proportionally elevated.—It is that species of inflorescence, wherein the peduncles arise from different heights, and, the upper ones becoming gradually shorter than the lower, the flowers form nearly an even surface, as in *Wall Flower*, *Mustard*, and other *Cruciform Plants*. See Plate VII. f. 2. It differs from a simple umbel, in the peduncles not arising from a common centre; and from a spike, in having its flowers on peduncles, and elevated to nearly the same height, in consequence of the lower ones being proportionally longer than the rest.

8. A **RACEME** (*racemus*) consists of a rather long peduncle, with short lateral branches or pedicels, as in the *Currant*, &c. See Plate VII. fig. 3. It differs from a spike, in having its flowers on partial peduncles; and from a corymb, in having its peduncles nearly of equal length.

9. A PANICLE (*panicula*) is composed of flowers, loosely dispersed upon peduncles, which are variously subdivided, as in *Oat*, &c. See Plate VII. fig. 4.
10. A THYRSE (*thyrsus*) is a panicle, condensed into an ovate form, as in *Lilac*, and *Butter-bur*.
11. A FASCICLE (*fasciculus*) has several, erect, parallel peduncles, bearing flowers, which are approximated and fastigate, as in *Sweet William*.
12. A HEAD (*capitulum*) is formed from several flowers, collected into a globular form, as in *Thrift*.
13. A VERTICIL (*verticillus*) is that species of inflorescence, in which many flowers surround the stem, like a ring, as in *Mint*, *Horehound*, &c. See Plate VII. fig. 6. a. a.
14. A COMPOUND FLOWER (*compositus flos*) has several sessile florets on an entire, dilated receptacle, as in the *Daisy*, *Thistle*, &c. See Plate VII. fig. 8. 9. 10.
15. AN AGGREGATE FLOWER* (*aggregatus flos*), properly so named, has numerous florets, with short peduncles, on a dilated receptacle, as in *Scabious* and *Teasel*.

IV. The HYBERNACLE (*hybernaculum*), or Winter-quarters, is defined by Linnæus to be "the scaly compendium of the whole herb." It is that part of a plant, by which the embryo, or future shoot, is protected from external injuries, during the winter, and is of two kinds, *Bulb* and *Bud*.

1. A BULB (*bulbus*) is an hybernacle, formed from the remains, or bases of past leaves. It is generally placed upon the descending *caudex*, or root, and has been, though improperly, considered as the root itself. *Onion*, *Tulip*, *Lily*, afford instances of different species of bulbs. Some flowers, as those of *Allium*, are succeeded by bulbs, instead of seeds. See Plate I. fig. 6. 7. 8.
2. A BUD (*gemma*) is formed of the rudiments of future leaves, scales, stipules, or petioles, and is situated on the ascending *caudex*, or stem and branches. Buds are distinguished according as they include leaves, or flowers, singly, or both together. Most plants are observed to have buds in cold regions, and few in warm climates.

The FRUCTIFICATION (*fructificatio*) is a temporary part of vegetables, appropriated to generation. It includes the flower

* In its most comprehensive signification, an *Aggregate Flower* includes likewise the *Compound*, *Umbellate*, *Cymose*, *Amentaceous*, *Glumose*, and *Spadiceous Flowers*.

and fruit; † and, when complete, consists of seven parts, *Calyx*, *Corol*, *Stamen*, *Pistil*, *Pericarp*, *Seed*, and *Receptacle*. The four first of these belong to the flower, the two next to the fruit, and the last is common to both, though it is considered as belonging to the fruit by Linnæus.

I. The CALYX (*calyx*) is the outermost integument, or covering of the fructification, and is considered by Linnæus as a continuation, or expansion of the outer bark (*cortex*) of the plant. It includes seven species, namely, *Perianth*, *Involucre*, *Glume*, *Ament*, *Spathe*, *Calyptre*, and *Valve*.

1. A PERIANTH (*perianthium*) is the most common species of calyx, and is frequently called the calyx exclusively. It is contiguous to the remaining parts of fructification, and consists of one or more parts, termed leaves or leaflets, which are mostly of a green colour, as in the *Rose*, *Primrose*, &c. See Plate VI. fig. 2. *a.* and fig. 7. *a.*

2. An INVOLUCRE (*involucrum*) is a calyx, stationed at a distance from the other parts of the flower, and is most frequently observed in the umbelliferous plants, as in *Carrot*, *Fennel*, &c. It is named a *general* or *universal involucre*, when it is placed at the base or origin of an universal umbel. See Plate VII. fig. 5. *b. b.*

And it is styled an *Involucret* (*involucellum*), or *partial involucre*, when it is stationed at the base, or foot of a partial umbel. See Plate VII. fig. 5. *c. c. c.*

3. A GLUME (*gluma*) is the calyx, or outer husk of a Grass. It generally consists of two parts named valves. See Plate VI. fig. 6. * *a.*

4. An AMENT (*amentum*) is considered by Linnæus both as a species of Inflorescence, †† and as a Calyx. But it seems more proper to consider the entire ament as a species of inflorescence, and the *scales*, belonging to each of the flowers, as so many calyxes. See Plate VII. fig. 7. It is commonly named a *Catkin*.

5. A SPATHE (*spatha*) is a calyx, which bursts longitudinally. It always accompanies that kind of inflorescence, which is named a *spadix*, and is likewise met with in some plants, which have no spadix, as *Snowdrop*, *Daffodil*, *Crocus*, &c. See Plate VI. fig. 1. *a.* and fig. 8. *a.*

† By fruit, in common language, is understood the seed with its pericarp, or seed-vessel; but the seed alone, in many cases, constitutes the fruit, the pericarp being either altogether wanting, or so indistinct as not to be noticed.

†† See page vii. of this Introduction.

6. A CALYPTRE (*calyptra*) is the calyx of a Moss, covering the anther, like a hood or cowl, as defined by Linnæus. See Plate IX. fig. 24. B. a. But the part, which he has denominated *anther*, is a true capsule or seed-vessel, and the *calyptra* is improperly considered as a Calyx. See Calyptra in the Dictionary.

7. A VOLVE OR CURTAIN (*volva*) is the membranous calyx of a fungus, surrounding the stalk, and attached to the pileus or cap. See Plate IX. fig. 24. D. b.

II. The COROL (*corolla*) is the inner tegument, or covering of a flower, and is formed, according to Linnæus, of an expansion of the inner bark (*liber*) of the plant.

It is, in general, of a finer texture, and more beautifully coloured than the perianth. Yet there are many exceptions, the latter being sometimes red, as in *Bartsia*, and the former green, as in *Daphne Laureola*, &c.*

The corol is composed of one or more leaf-like pieces, named PETALS, and is styled a one, two, three, or many-petalled corol, according to the number of these.

When a corol consists of one petal only, the lower contracted part is named the *tube*; and the upper dilated part is named the *limbus*. See Pl. VI. fig. 4. a. b.

When a corol is formed of two, or more petals, the inferior narrow part of each is named the *claw*, and the superior expanding part the *lamina*. See Plate VI. fig. 8. a. b. The whole of the dilated part, or border of the corol is likewise, in this case, named the *limbus*.

The NECTARY (*nectarium*), which is the part of a flower, appropriated to produce and contain the honey, is most frequently united with the corol, and is commonly considered as an appendage to it; but it is sometimes perfectly distinct from the petals, being attached to the calyx, &c., and has different terms applied to it on this account.

* When a flower has two or three coverings, the perianth and corol are distinguished with ease, but, where only one integument is found, the distinction becomes very difficult, or perhaps impossible. It is most common, indeed, to consider the single integument, if of a green colour, as a perianth, and if white, or any colour, green excepted, as a corol. Linnæus has been desirous to make the proper distinction to consist in this, that a perianth has its segments, or leaflets, opposite to the stamens; and that a corol has its petals, or divisions, placed alternately with them. But, if this rule be adopted, the beautifully coloured integument, which is considered by Linnæus as the *corol* in the *Tulip*, *Lily*, and other Liliaceous plants, ought to be named the perianth. And Linnæus acknowledges, in his Lectures on the Natural Orders, that no line of distinction can be drawn between the Perianth and Corol; for which reason De Necker and Hedwig have proposed to call them both by one name. See Dictionary Art. Perigonium.

This part is frequently in the form of a horn, or spur, as in *Violet*, *Butterwort*, and *Larkspur*. See Vol. II. Pl. I. Div. 13. B. a. Sometimes it is in the form of a cup or tube, as in *Narcissus*. See Plate VI. fig. 22. In *Wallflower*, and other Cruciform plants, it is merely a small gland, placed at the base of the germen. In *Grass of Parnassus* it is of a very singular and beautiful structure. See Vol. II. Pl. I. Div. 5. F. In many flowers the Nectary is entirely wanting, or is, at least, indistinct, and unnoticed in the description of them.

III. The STAMENS (*stamina*) are the male organs of the flower, appropriated to the preparation of the *pollen*, or substance necessary for the impregnation of the pistil, and are supposed by Linnæus to be a continuation of the wood. See Plate VI. fig. 7. e. e. e.

They consist of two parts, named the *Filament*, and the *Anther*.

1. The FILAMENT (*filamentum*) is the part, which supports the anther, and connects it with the flower. See Pl. VI. fig. 9. a. It varies in length, and other circumstances, and is sometimes entirely wanting, or so short as not to be perceived; but the anther is always present, and is regarded as the essential part of the stamen.
2. The ANTHER (*anthera*) is situated on the top of the filament. See Pl. VI. fig. 9. b. And it contains the powdery substance, named the *pollen*, which it emits when ripe. See Plate VI. fig. 7. g. h.

IV. The PISTIL (*pistillum*) is the female organ, destined for the reception of the pollen, and is supposed by Linnæus to be a continuation of the pith or medulla.* Its usual appearance is that of a column, occupying the centre of the flower. When perfect,

* The Calyx, Corol, Stamens, and Pistil, corresponding in situation with the outer and inner bark, the wood, and pith of a plant, the supposition of Linnæus, that the pistil is formed from the pith, the stamens from the wood, the corol from the inner bark, and the calyx from the outer bark, seems very probable at first view; however, upon a nicer examination, it is found, that if this opinion have any foundation, it is liable to numerous exceptions, for the petals are in many instances inserted in the calyx; the stamens frequently arise from the calyx, and corol, and sometimes from the pistil; in the compound flowers the germens of the numerous florets support the corol, and the corol the stamens, which could not be the case, if each of these parts were a continuation of the different substances of the plant, as stated by Linnæus. The circumstance of many flowers having the number of their petals, increased to such a degree, as to exclude the stamens entirely, may be urged as an additional argument against this opinion; since the innermost petals, in these cases, evidently arise from the very points, whence the stamens should have sprung, and may therefore, with as much reason, be considered as an expansion or continuation of the wood. See Hedwig's Fund. Hist. Nat. p. 53.

It is composed of three parts, *Germen*, *Style*, and *Stigma*. See Plate VI. fig. 7. *b. c. d.*

1. The **GERMEN** (*germen*) is the lowest part, or base of the pistil, and is the rudiment of the fruit, since it becomes the seed-vessel, or one or more naked seeds. See Plate VI. fig. 10. *a.*
2. The **STYLE** (*stylus*) is the intermediate part of the pistil, which, rising from the germen, supports the stigma. See Plate VI. fig. 10. *b.*
3. The **STIGMA** (*stigma*) is the summit of the pistil, and is generally moist, that it may detain the pollen, which falls upon, or is conveyed to it. See Plate VI. fig. 10. *c.*

The Style is frequently wanting, and therefore is not so necessary as the *Germen* and *Stigma*, which are always present. The *Stigma* is made the essential part by Linnæus, the *Germen* however appears to be at least equally so, since there can be no formation of fruit, unless it be present.*

V. The **PERICARP** (*pericarpium*) is the vessel, or organ, within which the seeds are contained. It is nothing more than the germen, or lowest part of the pistil, advancing to, or arrived at a state of maturity, after the flowering is over. Eight species of pericarp are enumerated, and defined by Linnæus, namely, *Capsule*, *Silique*, *Legume*, *Follicle*, *Drupe*, *Pome*, *Berry*, and *Strobile*.

1. A **CAPSULE** (*capsula*) is a hollow, membranous pericarp, opening in a determinate manner, but differently in different plants. See Plate VII. fig. 2. 3. 4. The *Poppy* and *Tulip* afford examples of this species.
2. A **SILIQUE** (*siliqua*) is a membranous pericarp, consisting of two valves, and having the seeds attached to both sutures, or seams, as in *Radish*, *Mustard*, &c. See Plate VIII. fig. 30.
3. A **LEGUME** (*legumen*) is a membranous, two-valved pericarp, with the seeds affixed to one suture only, as in *Pea*, *Vetch*, &c. See Plate VIII. fig. 29.
4. A **FOLLICLE** (*folliculus*) is a membranous, one-valved pericarp, which opens lengthways, and has the seeds

* The Essence of the **FLOWER** consist in the *Anther* and *Stigma*.

..... of the **FRUIT** consists in the *Seed*.

..... of the **FRUCTIFICATION** consists in the *Flower*, and *Fruit*.

..... of **VEGETABLES** consists in the *Fructification*.

LIN. Phil. Bot. § 88.

attached to a receptacle, (not to the suture or sides of the valve) as in *Periwinkle*. See Plate VIII. fig. 7.

5. A **DRUPE** (*drupa*) is a pulpy, or fleshy, valveless pericarp, containing a nut, or stone, as in *Plumb*. See Plate VIII. fig. 9.
6. A **POME** (*pomum*) is a fleshy, or pulpy pericarp, which has its seeds inclosed in a capsule, as in *Pear*. See Plate VIII. fig. 8.
7. A **BERRY** (*bacca*) is a juicy, or pulpy pericarp, without valves, and containing seeds, which have no other covering, as in *Currant* or *Gooseberry*. See Plate VIII. fig. 12. The fruit of *Raspberry* is an example of a compound berry. See Plate VIII. fig. 11. The fruit of *Strawberry* is improperly named a berry, the seeds being placed on the outside of a succulent receptacle. See Pl. VIII. fig. 28.
8. A **STROBILE** (*strobilus*) is a kind of pericarp, formed from an Ament, the imbricated scales becoming indurated, as in *Pine*. See Plate VI. fig. 5.

VI. A **SEED** (*semen*) is the rudiment of a new plant, or a deciduous part of a plant, containing the rudiment of a new one, vivified by the aspersion of the pollen.

It is considered as the *ovule*, or *egg* of a vegetable, and the pericarp as the *ovary*. When the pericarp is wanting, or inconspicuous, a seed is said to be *naked*; as in *Mint*, *Borage*, &c.

Seeds are composed of three principal parts, the *Corcle*, *Cotyledons*, and *Integuments*.

1. The **CORCLE** (*corculum*) is the embryo, or rudiment of the future plant, and is the essence of the seed. It consists of the *Plumule* (*plumula*), or scaly ascending part, which becomes the herb, Plate XI. fig. 8. *d.*; and the *Rostel* (*rostellum*), or simple descending part, which becomes the root. See Plate XI. fig. 8. *c.* and fig. 11. *d.*
2. The **COTYLEDONS** (*cotyledones*) are defined by Linnæus to be the lateral bodies of the seed, bibulous, and caducous. See Plate XI. fig. 8. *b.* They consist of farinaceous matter, and are destined to nourish the young plant, till it has acquired the power of supporting itself by its own root, and are commonly named the *seed-lobes*, whilst they remain quiescent within the seed, and the *seed-leaves*, when they quit the seed, and rise above the surface of the earth. Some plants have only one cotyledon, as *Grasses*; most have two, as *Pea*; some have more, as *Pine*; and others have none.
3. The **INTEGUMENTS** envelop the corcle and cotyledons.

A particular account of these is given in Gærtner's Terms and Definitions. p. 147.

It is not necessary to consider the remaining parts of seeds in this place.

VII. The RECEPTACLE (*receptaculum*) is the base, by which the parts of fructification are connected with the plant. It is either *proper*, or *common*. A *proper* receptacle sustains only the parts, belonging to one fructification. See Plate VI. fig. 8. c. A *common* receptacle sustains, and connects several flowers, and their fruits in such a manner, that, if any of them be removed, an appearance of irregularity is occasioned. Instances of this kind of receptacle occur in the *Compound Flowers*, see Plate VI. fig. 16; in the *Aggregate Flowers*, properly so called, in the *Umbellate*, *Cymose*, *Spadiceous*, and *Spiked Flowers*.*

The Receptacle is further distinguished, according as it sustains one or more of the parts of a single fructification, being named the *Receptacle of the Fructification*, when it is common to both the flower and fruit.

————— *Flower*, when it supports the flower, and not the fruit.

————— *Fruit*, when it supports the fruit, and not the flower.

————— *Seeds*, when it constitutes the base, or part, by which the seeds are attached to the inside of the pericarp.

The *Calyx*, *Corol*, *Stamens*, *Pistil*, *Pericarp*, *Seed*, and *Receptacle*, are not found in the fructification of every plant.

Most plants have all these seven parts, but want the Nectary; as *Primrose*, *Pink*, *Convolvulus*, *Honeysuckle*, *Speedwell* (*Veronica*). A figure of the fructification of the last is given in Vol. II. Plate I. Div. 2. B.—Some have all, and the Nectary; as *Daffodil*, *Violet*, *Butterwort*, and *Grass of Parnassus* (*Parnassia*), which is figured in Vol. II. Pl. I. Div. 5. F.

Some want the Calyx, and Nectary; as *Tulip*, and *Solomon's Seal* (*Convallaria*). Of the latter a figure is given in Vol. II. Pl. I. Div. 6. A. Others want the Calyx, but have the Nectary; as *Crown Imperial*, *Monkshood*, *Larkspur* (*Delphinium*), *Columbine* (*Aquilegia*). For the fructification of the two last, see Vol. II. Pl. II. Div. 13. B. C.

In some plants the Corol is wanting, as in *Ladies-Mantle*, *Goose-foot*, *Buckwheat* (*Polygonum*). *Polygonum* is figured in Vol. II. Pl. II. Div. 8. B.

In some the Stamens are wanting in some of the flowers, and the Pistils in others; as in *Nettle*, *Hazel*, *Arrowhead*, and *Seg*

* See above, page vi.

(*Carex*). Of the two kinds of flowers, belonging to the last, figures are given in Vol. II. Plate III. Div. 21. B.

The Pericarp is wanting in *Mint*, *Skull-Cap*, *Dead-Nettle*, *Horehound*, and *Crowfoot*. *Skull-Cap* (*Scutellaria*), which has no nectary (unless the tube of the corol be considered as such) is figured in Vol. II. Pl. II. Div. 14. B. *Crowfoot* (*Ranunculus*) has as many nectaries as petals, and is figured in Vol. II. Pl. II. Div. 13. D.

Both Pericarp and Seeds are wanting in all flowers, which have no Pistil.

The Receptacle is never wanting, but it, in general, presents so little variety, that it is scarcely ever noticed in the characters of plants, except those which have Compound, or Aggregate Flowers.

FLOWERS are named *complete*, which have both a Calyx and Corol.

Flowers, which want either the Calyx or Corol, are named, generally, *incomplete*; but, more particularly, those are named *apetalous*, which have no Corol; and those, which have no calyx, are named *naked*. It would seem, however, more proper to apply the last term to flowers, wanting both the integuments.

Flowers, having both stamens and pistils, are named *hermaphrodite*, or *perfect*.

Flowers, which want either, are named *imperfect*. Those, which have no pistil, are named *male*, or *stamiferous* flowers. And those, in which there are no stamens, are named *female*, or *pistilliferous* flowers.

The reader ought not to remain satisfied with the ideas, which he has acquired of the different parts of fructification from the figures referred to: But, before he proceeds to the next chapter, should examine carefully several flowers, beginning with the larger ones, as a *Tulip*, *Lily*, or *Rose*, and carefully avoiding the *full*, or double flowers, which, however highly they may be esteemed for their beauty, are monstrous productions, and unfit for the purposes of the botanist.

CHAPTER II.

OF THE DIVISIONS OF THE LINNEAN SYSTEM, AND
THE METHOD OF INVESTIGATING PLANTS.

Of the various systems of Botany, that have been constructed, none have been found so convenient, and useful in practice, or are, at this time, so generally adopted, as the System, of which it is the object of this introduction to give an explanation. It is named *Linnean*, from being the invention of the celebrated Linnaeus, Professor of Botany at Upsal, in Sweden; and *Sexual*, from being established on the opinion, that the stamens and pistils are the sexual organs of plants, and indispensably necessary to the production of fertile seeds; an opinion, that has received the fullest confirmation from numerous observations, and well conducted experiments.* Some of these are detailed under *SEX* in the Dictionary.

It has already been intimated, that this System is divided into *Classes*, *Orders*, *Genera*, *Species*, and *Varieties*, each of which will now be considered more particularly.

I. OF THE CLASSES.

The Classes, or primary divisions, are twenty-four. Their Names are each compounded of two Greek words, and are expressive of the leading circumstances of their Characters, which are founded principally on the number, proportion, connection, and situation of the Stamens, or Males. To the first twenty-three are referred all the plants, which have conspicuous flowers, and evident stamens, and pistils. The last includes all those, that have inconspicuous flowers, and in which the stamens, and pistils, are either too minute to be seen by the naked eye, or have hitherto entirely eluded the researches of botanists. The further consideration of the last class (*Cryptogamia*), as more difficult, will be deferred, till the method of investigating the orders, genera, species, and varieties of all the others has been delivered.

* It may be proper to notice here, that, besides the sexual system, Linnaeus has formed a method, established on the difference, observable in the form, &c. of the *CALYX*, of which an outline is given in the Dictionary, page 235. He has likewise attempted to reduce plants to *NATURAL ORDERS*. See Volume II. page 296. And he has divided Vegetables into *TRIBES*, *FAMILIES*, and *NATIONS*. See *Tribe*, &c. in the Dictionary.

CLASS I. MONANDRIA.*

One stamen in an hermaphrodite, or perfect flower. See Plate IX. fig. 1.

II. DIANDRIA.

Two stamens in a perfect Flower. See Plate IX. fig. 2.

III. TRIANDRIA.

Three stamens in a perfect flower. See Plate IX. fig. 3.

IV. TETRANDRIA:

Four stamens in a perfect flower. See Plate IX. fig. 4.

Obs. If the two nearest stamens be constantly shorter than the other two, the plant must be referred to the 14th Class.

V. PENTANDRIA.

Five stamens in a perfect flower. See Plate IX. fig. 5.

VI. HEXANDRIA.

Six Stamens in a perfect flower. See Plate IX. fig. 6.

Obs. If the two opposite stamens be constantly shorter than the others, the plant belongs to the 15th Class.

VII. HEPTANDRIA.

Seven stamens in a perfect flower. See Plate IX. fig. 7.

VIII. OCTANDRIA.

Eight stamens in a perfect flower. See Plate IX. fig. 8.

* For the derivation of Monandria (which signifies one male, or husband), and the names of the other Classes, see the Dictionary.

IX. ENNEANDRIA.

Nine stamens in a perfect flower. See Plate IX. fig. 9.

X. DECANDRIA.

Ten stamens in a perfect flower. See Plate IX. fig. 10.

XI. DODECANDRIA.

Twelve to nineteen stamens, inserted in the receptacle, in a perfect flower. See Plate IX. fig. 11.

XII. ICOSANDRIA.

Twenty stamens (often more, sometimes fewer), inserted in the inside of the calyx, not in the receptacle, in a perfect flower. See Plate IX. fig. 12.

XIII. POLYANDRIA.

More than twenty stamens, inserted in the receptacle, in a perfect flower. See Plate IX. fig. 13.

XIV. DIDYNAMIA.

Four stamens in a perfect flower, the two nearest constantly shorter than the others. See Plate IX. fig. 14.

XV. TETRADYNAMIA.

Six stamens in a perfect flower, the two opposite ones constantly shorter than the other four. See Plate IX. fig. 15.

XVI. MONADELPHIA.

The stamens united by their filaments into one body, set, or brotherhood, in a perfect flower. See Plate IX. fig. 16.

XVII. DIADELPHIA.

The stamens united by their filaments into two bodies, in a perfect flower. See Plate IX. fig. 17.

XVIII. POLYADELPHIA.

The stamens united by their filaments, into three or more bodies, in a perfect flower. See Plate IX. fig. 18.

XIX. SYNGENESIA.

The stamens united by their anthers (seldom by their filaments) into a cylinder, in a perfect flower. See Plate IX. fig. 19.

XX. GYNANDRIA.

The stamens inserted in the pistils (not in the receptacle). See Plate IX. fig. 20.

XXI. MONOECIA.

The stamens and pistils in distinct flowers, but on the same individual plant. See Plate IX. fig. 21.

XXII. DIOECIA.

The stamens and pistils in distinct flowers, and on different plants. See Plate IX. fig. 22.

XXIII. POLYGAMIA.

Perfect and Imperfect flowers on the same, or on two, or three different plants of the same species. See Plate IX. fig. 23.

From the characters given above it appears ;

- 1st. That the plants, comprehended in the first twenty Classes of the Linnean System, bear perfect flowers, or have their stamens and pistils in the same flower.
- 2dly. That in the first thirteen Classes, MONANDRIA—POLYANDRIA, the stamens are all of the same length, or, at

least, that two of them are not constantly shorter than the others; and that they do not cohere with each other (either by their filaments or anthers), or with the pistils.

3dly. That in the 14th and 15th classes, DIDYNAMIA and TETRADYNAMIA, two stamens are found constantly shorter than the others.

4thly. That in the 16th, 17th, and 18th classes, MONADELPHIA, DIADELPHIA, and POLYADELPHIA, the stamens are united by their filaments into one, two, three, or more bodies or sets, termed brotherhoods.

5thly. That in the 19th class, SYNGENESIA, the stamens are united by their anthers, so as to form a cylindrical tube.

6thly. That in the 20th class, GYNANDRIA, the stamens are inserted in the pistil, instead of the receptacle. Some exceptions indeed occur, but these will be more properly considered hereafter.

7thly. That the plants, comprehended in the 21st and 22d classes, MONOECIA and DIOECIA, bear imperfect flowers only, or have their stamens and pistils in distinct flowers. And

8thly. That the plants, belonging to the 23d class, POLYGAMIA, bear both perfect, and imperfect flowers.

The Key of the Sexual System given in the Dictionary, at page 236, may now be very properly consulted. It presents, at one view, all the classes with their definitions, and will be more easily understood than the Key, given at page 57 of the Botanical Terms, which may be afterwards attended to.

II. OF THE ORDERS.

The Orders are the secondary divisions of the System, and are much more numerous than the Classes.

In the first twenty-three classes, their names are expressive of their characters, and are all single words, except in the class Syngenesia.

Their Characters are taken from different circumstances, viz.

1. From the number of the pistils, as *Monogynia*, &c.
2. From the seeds being naked, as *Gymnospermia*.
3. From the pericarp, as *Angiospermia*, *Siticulosa*, *Siliquosa*.
4. From the number, connection, and insertion of the stamens, as *Monandria*, *Monadelphia*, *Syngenesia*, *Gynandria*.
5. From the sex and disposition of the florets, as *Polygamia Aequalis*, *Polygamia Superflua*, &c.

6. From the number of houses, occupied by plants of one species, as *Monoeëcia*, *Diœcia*, *Trioëcia*.

In the first thirteen classes (*MONANDRIA*—*POLYANDRIA*), the Names and Characters of the Orders are taken solely from the *Number of the Pistils*, which is determined by counting the number of the styles, when present, at their base; and, when the styles are wanting, by taking the number of the stigmas. This circumstance is particularly necessary to be attended to; for, since there is frequently only one germen, when there are two or more styles, if we do not reckon the styles, we may be led to consider a plant as having only one pistil, which is described by Linnæus, as having two, three, or many pistils: And, as there are frequently two, three, or more stigmas upon a single style, if we take the number of pistils, in these instances, from the stigmas, we shall be led into the contrary error, and consider a flower as having two or more pistils, which, according to Linnæus, has only one.

The Orders, taken from the number of the pistils, are the ten following; but they do not all occur in each of the thirteen above mentioned classes: Some of them occur in all, others in several, and others in only one class.

1. *MONOGYNIA**. One Pistil, or Female. See Plate IX. fig. 2.
2. *DIGYNIA*. Two Pistils. See Plate IX. fig. 3.
3. *TRIGYNIA*. Three Pistils. See Vol. II. Pl. I. Div. 3. G. d.
4. *TETRAGYNIA*. Four Pistils. See Vol. II. Pl. I. Div. 4. G. b.
5. *PENTAGYNIA*. Five Pistils. See Vol. II. Pl. I. Div. 5. G. b.
6. *HEXAGYNIA*. Six Pistils. See Vol. II. Pl. II. Div. 9. A.
7. *HEPTAGYNIA*. Seven Pistils.
8. *DECAGYNIA*. Ten Pistils.
9. *DODECAGYNIA*. Twelve Pistils. See Vol. II. Pl. II. Div. 11. D. b.
10. *POLYGYNIA*. Many Pistils. See Vol. II. Pl. II. Div. 12. E. a.

In the 14th Class (*DIDYNAMIA*) the Names, and Characters of the Orders, which are only two, are taken from the presence, or absence of a pericarp, viz.

* The names of this, and the nine following orders are each formed from two Greek words, denoting the number of females, or wives; and their derivation is given in the Dictionary.

1. **GYMNOSPERMIA.** Four naked seeds in the bottom of the calyx. See Vol. II. Pl. II. Div. 14. B. *d.*

2. **ANGIOSPERMIA.** The seeds enclosed in a Pericarp. See Vol. II. Pl. II. Div. 14. C. *c.*

In the 15th Class (**TETRADYNAMIA**) the Names, and Characters of the Orders, are taken from the nature of the pericarp, and are only two.

1. **SILICULOSA.** The seeds contained in a *silicle*. See Vol. II. Plate II. Div. 15. B. *c.*

2. **SILIQUOSA.** The seeds contained in a *siliqua*. See Vol. II. Pl. II. Div. 15. D. *d.*

A *Silicle* is a roundish pericarp composed of two valves, with the seeds fixed to both sutures, and furnished with a style, which is often longer than the silicle. See Plate VIII. fig. 6.

A *Siliqua* is a long, two valved pericarp, with the seeds attached to both sutures, and having only a very short style. See Plate VIII. fig. 30.

In the 16th, 17th, and 18th classes (**MONADELPHIA**, **DIADELPHIA**, **POLYADELPHIA**) the Names, and Characters of the Orders are taken from the Number of the stamens, and are the ten following. But they do not all occur in any one of the classes.

1. **TRIANDRIA.** Three stamens.

2. **PENTANDRIA.** Five stamens.

3. **HEXANDRIA.** Six Stamens. See Vol. II. Plate III. Div. 17. A. *a.*

4. **OCTANDRIA.** Eight Stamens. See Vol. II. Plate III. Div. 17. B.

5. **ENNEANDRIA.** Nine Stamens.

6. **DECANDRIA.** Ten Stamens. See Vol. II. Plate III. Div. 17. D. *d.*

7. **ENDECANDRIA.** Eleven Stamens.

8. **DODECANDRIA.** Twelve Stamens.

9. **ICOSANDRIA.** Twenty Stamens.

10. **POLYANDRIA.** Many Stamens. See Vol. II. Plate III. Div. 16. B. *c.* and Div. 18. A. *a.*

In the 19th Class (**SYNGENESIA**) the six Orders take their Names, and Characters from the sex, and disposition of the florets.

1. **POLYGAMIA ÆQUALIS.** All the florets perfect. See Vol. II. Plate III. Div. 19. A.

2. **POLYGAMIA SUPERFLUA.** The florets of the disk (or centre) perfect, those of the ray (or circumference) female; and both fertile. See Vol. II. Pl. III. Div. 19. B.

3. **POLYGAMIA FRUSTRANEA.** The florets of the disk perfect, and fertile; those of the ray female and barren, or neuter. See Vol. II. Plate III. Div. 19. C.
4. **POLYGAMIA NECESSARIA.** The florets of the disk hermaphrodite, but barren; those of the ray female and fertile.
5. **POLYGAMIA SEGREGATA.** Several partial flower-bearing calyxes, included in a common calyx, so as to constitute only one flower.*
6. **MONOGAMIA.** A single perfect flower, having the anthers united with each other. See Vol. II. Plate III. Div. 19. D.

In the 20th Class (**GYNANDRIA**) the Names and Characters of the nine orders are taken solely from the number of the stamens, and do not require any explanation; they are the following, viz. *Diandria*, *Triandria*, *Tetrandria*, *Pentandria*, *Hexandria*, *Octandria*, *Decandria*, *Dodecandria*, *Polyandria*.

In the 21st and 22d Classes (**MONOECIA** and **DIOECIA**), besides the twelve orders named from the number of the stamens, and which it will not be necessary to define again, viz. *Monandria*, *Diandria*, *Triandria*, *Tetrandria*, *Pentandria*, *Hexandria*, *Heptandria*, *Octandria*, *Enneandria*, *Decandria*, *Dodecandria*, *Polyandria*, we have the three following, taken from the connection, and insertion of the stamens.

13. **MONADELPHIA.** The stamens united by their filaments into one set.
14. **SYNGENESIA.** The stamens united by their anthers.
15. **GYNANDRIA.** The stamens inserted in the pistils.

In the 23d Class (**POLYGAMIA**) the orders are three, and take their Names and Characters from the number of houses, or plants of one species, in which the flowers are found, viz.;

1. **MONOECIA.** Perfect and male flowers, or perfect and female flowers on the same individual plant.
2. **DIOECIA.** Perfect and male, or perfect and female flowers on two different individuals.
3. **TRIOECIA.** Perfect, male, and female flowers, on three different individuals.†

* In these five Orders Linnæus has found it necessary to employ two words for the names, a circumstance which he has avoided in every other instance.

† The Characters of the Orders are also given amongst the Botanical Terms. p. 60.

When the reader has made himself acquainted with the definitions of the Classes and Orders, and has attended to the illustrations of these, given in Plate IX, and in the three plates of Volume 2d; he may examine the flowers of as many of the british plants, which are subjoined as examples of each class and order, as are sufficient to give him correct ideas of the construction of these. It would be improper for him to examine, in this way, all the examples that are given, a greater number, than is requisite for any one person, having been put down, in order to accommodate those, who know but few plants by sight and name; who may begin to study botany at different seasons of the year, when only a part of them are in flower; or who live in different parts of the kingdom, and cannot have access to the whole of them, some plants, which are extremely common in one county, or neighbourhood, being very rare, or not to be found in another.

Before the reader enters upon the examination of real flowers, it will be proper to inform him: 1st. That he should be provided with a few botanical instruments, namely, a small knife, a needle, and a pair of forceps, or nippers, such as are figured in Plate IX: A penknife, or a lancet, and a needle with a triangular point, such as is used by glovers, will supply the place of the botanical knife and needle, if these cannot be easily procured. The forceps will be found very necessary for taking hold of the smaller flowers, or their parts; and the *slide*, represented in the plate, renders its use much more convenient, as it relieves us from the necessity of making a constant pressure upon the instrument with our fingers, to prevent the plant from falling out. A small pair of scissors will also be found very useful, for removing the whole, or a part of the calyx, and corol, so as to bring the stamens and pistils into view.

2dly. That, as the stamens, and pistils of some flowers, are too small to be seen very distinctly by the naked eye, it will be necessary to have a microscope, consisting of one or two lenses, set in a case, as figured in Plate XII. fig. 1.* The method of using this glass is likewise represented in the same plate, fig. 2, because it is of consequence to be able to hold the flower and glass in the same hand, and to have the other at liberty to display the parts of the flower, with the needle, or knife, whilst we have it magnified. Should it be necessary to use the forceps, this instrument, with the flower, may be held very commodiously in the same hand with the glass. One of the lenses may be used in the state they are bought; and the other may be rendered black, by paint, or a

* This plate is copied from one given by Hedwig, in his *Theoria*, &c.

piece of court-plaster, except a circle of about a quarter of an inch in diameter in the middle, by which means very small objects may be more distinctly seen. This kind of glass is the least expensive, very portable, easily used, and will answer the purpose sufficiently well, except in the investigation of plants, belonging to the last class (*Cryptogamia*), for which a higher magnifying power is required.

3dly. That, in collecting flowers for the examination of the classes, and orders, he should have them in different states, some unopened, or just beginning to open, others fully expanded, and others, wherein the fruit is formed, or even pretty far advanced. For, though the stamens and pistils are, in general, examined with most ease in the expanded state of the flower, it occasionally happens, that some of these parts may have been removed, or have dropped off, and the number of them may, on that account, appear less than natural, and lead us into an error, that may be corrected by counting the stamens, and pistils of an unexpanded flower, none of which can possibly have been lost. And it has been shewn above, that the characters of four of the orders are taken from the Seeds, and Pericarp, whence arises the necessity of having some flowers, in which the germen has passed into the fruit. The specimens should be carried home in a tin box, made convex on one side, and concave on the other, and rounded at the edges, that it may be better adapted to the pocket. The box should be about ten inches in length, five and a half in breadth, and one and half in depth. The lid should be on the concave side, should open on hinges, and should be about two inches shorter, and one and a half narrower, than the body of the box. The whole of the box ought to be lacquered, or painted, to prevent it from rusting. In a box of this kind specimens may be preserved fresh, for two or three days, better than by putting them in water. Sometimes, however, it is necessary, in order to make the flowers expand, to place the stem of our plant in water, and to cover the whole with a glass bell, and expose it to the sun.

+ Both the English and Latin names of the genera are given, and those which are italicized are situated, and figured in Volume 2d, where the divisions of the plates correspond to numbers with the classes.

+ The flowers of *Linnaea* are represented in plate 1, and are those recommended in plate 1.

+ All the genera, belonging to this order, are figured, and their stamens and pistils are sufficiently compared, and the flowers are examined, when necessary, in a proper state.

piece of court-plaster, except a circle of about a quarter of an inch in diameter in the middle, by which means very small objects may be more distinctly seen. The kind of glass is the least expensive, very portable, easily used, and will answer the purpose sufficiently well, except in the investigation of plants, belonging to the last class (Polypetala), in which a magnifying power is required.

CLASS I. MONANDRIA.

ORDER. MONOGYNIA. Mare's Tail (*Hippuris**),† Marsh Samphire (*Salicornia**).

DIGYNIA. Star-grass (*Callitriche**).††

CLASS II. DIANDRIA.

ORDER. MONOGYNIA. Privet (*Ligustrum**), Speedwell (*Veronica**), Butterwort (*Pinguicula**). No begged.

DIGYNIA. Spring Grass (*Anthoxanthum**).

CLASS III. TRIANDRIA.

ORDER. MONOGYNIA. Valerian (*Valeriana**), Clubrush (*Scirpus**), Saffron (*Crocus**).

DIGYNIA. Millet (*Milium**), Melic (*Melica**), Quake-grass (*Briza**), Dog's Tail (*Cynosurus**).†††

TRIGYNIA. Umbelliferous Mouse-ear (*Holosteum**).

CLASS IV. TETRANDRIA.

ORDER. MONOGYNIA. Least Gentian (*Exacum**), Teasel (*Dipsacus*), Scabious (*Scabiosa*), Plantain (*Plantago*).

DIGYNIA. Dodder (*Cuscuta**).

TETRAGYNIA. Pearlwort (*Sagina**), Holly (*Ilex*), Pondweed (*Potamogeton*).

† Both the English and Latin names of the genera are given, and those, to which an asterisk is affixed, are figured in Volume 2d, where the divisions of the plates correspond in number with the classes.

†† The flowers of *Callitriche* are frequently imperfect, or male, and female, and are thus represented in plate I.

††† All the genera, belonging to this order, are grasses, and their stamens, and pistils are sufficiently conspicuous, if the flowers be examined, when they are in a proper state.

CLASS V. PENTANDRIA.

ORDER. MONOGYNIA. Gromwell (*Lithospermum**), Pimper-
 nell (*Anagallis**), Borage (*Boerhaavia*), Primrose
 (*Primula*), Honeysuckle (*Lonicera*).

DIGYNIA. Gentian (*Gentiana**), Fool's Parsley
 (*Aethusa**), Goosefoot (*Chenopodium*), Carrot
 (*Daucus*).

TRIGYNIA. Elder (*Sambucus**), Guelder-Rose (*Vi-
 burnum*).

TETRAGYNIA. Grass of Parnassus (*Parnassia*).

PENTAGYNIA. Flax (*Linum**), Thrift (*Statice*).

POLYGYNIA. Little Mouse-tail (*Myosurus**).

CLASS VI. HEXANDRIA.

ORDER. MONOGYNIA. Solomon's Seal (*Convallaria**), Bar-
 berry (*Berberis*), Tulip (*Tulipa*), Daffodil
 (*Narcissus*).

TRIGYNIA. Arrow-grass (*Triglochin**), Dock (*Ru-
 mex*).

POLYGYNIA. Thrumwort (*Alisma**).

CLASS VII. HEPTANDRIA.

ORDER. MONOGYNIA. Chickweed Winter-green (*Trientalis*),
 Horse-Chesnut (*Hippocastanum†*).

CLASS VIII. OCTANDRIA.

ORDER. MONOGYNIA. Bilberry (*Vaccinium**), Willow-herb
 (*Epilobium*), Heath (*Erica*).

TRIGYNIA. Bistort, or Buckwheat (*Polygonum**).

TETRAGYNIA. Moschatel (*Adoxa**), Herb Paris
 (*Paris*).

CLASS IX. ENNEANDRIA.

ORDER. HEXAGYNIA. Flowering Rush (*Butomus**).

† *Hippocastanum*, though not a native of Great Britain, is here added, be-
 cause we have no indigenous genus in the 7th. Class, except *Trientalis*, which
 is not common.—The number of stamens in *Hippocastanum* is liable to varia-
 tion.

CLASS X. DECANDRIA.

- ORDER. MONOGYNIA. Winter-green (*Pyrola**), Wild Rose-mary (*Andromeda*).
- DIGYNIA. Saxifrage (*Saxifraga**), Pink, or Sweet William (*Dianthus*).
- TRIGYNIA. Sandwort (*Arenaria**), Stitchwort (*Stellaria*), Catch-fly (*Silene*).
- PENTAGYNIA. Mouse-ear (*Cerastium**), Wood Sorrel (*Oxalis*), Campion (*Lychnis*).

CLASS XI. DODECANDRIA.

- ORDER. MONOGYNIA. Willow-herb, or Grass-poly (*Lythrum**), Asarabacca (*Asarum*).
- DIGYNIA. Agrimony (*Agrimonia**).
- TRIGYNIA. Spurge (*Euphorbia**), Dyer's Weed (*Rhus*).
- DODECAGYNIA. Houseleek (*Sempervivum**).

CLASS XII. ICOSANDRIA.

- ORDER. MONOGYNIA. Plumb (*Prunus**).
- DIGYNIA. Hawthorn (*Crataegus**).
- TRIGYNIA. Mountain Ash (*Sorbus**).
- PENTAGYNIA. Meadow-sweet (*Spiraea**), Pear, or Apple (*Pyrus**).
- POLYGYNIA. Cinquefoil (*Potentilla**), Rose (*Rosa*), Raspberry (*Rubus*), Strawberry (*Fragaria*).

CLASS XIII. POLYANDRIA.

- ORDER. MONOGYNIA. Cistus (*Cistus**), Poppy (*Papaver*), Celandine (*Chelidonium*).
- TRIGYNIA. Larkspur (*Delphinium**).
- PENTAGYNIA. Columbine (*Aquilegia**).
- POLYGYNIA. Crowfoot (*Ranunculus**), Marsh Marigold (*Caltha*).

CLASS XIV. DIDYNAMIA.

- ORDER. GYMNOSPERMIA. Ground Ivy (*Glechoma**), Skull-cap (*Scutellaria**), Mint (*Mentha*), Selfheal (*Prunella*), Thyme (*Thymus*).
- ANGIOSPERMIA. Yellow Rattle (*Rhinanthus**), Foxglove (*Digitalis*), Lousewort (*Pedicularis*), Figwort (*Scrophularia*).

CLASS XV. TETRADYNAMIA.

- ORDER. SILICULOSA. Whitlow-grass (*Draba**), Shepherd's Purse (*Thlaspi**), Candytuft (*Iberis*), Scurvy-grass (*Cochlearia*).
- SILIQUOSA. Radish, or Charlock (*Raphanus**), Ladies' Smock (*Cardamine**), Wall-Flower (*Cheiranthus*), Mustard (*Sinapis*).

CLASS XVI. MONADELPHIA.

- ORDER. DECANDRIA. Crane's-bill (*Geranium**).
- POLYANDRIA. Mallow (*Malva**), Marsh Mallow (*Althæa*).

CLASS XVII. DIADELPHIA.

- ORDER. HEXANDRIA. Fumitory (*Fumaria**).
- OCTANDRIA. Milkwort (*Polygala**).
- DECANDRIA. Greenweed (*Genista**), Grass-vetch, or Vetchling (*Lathyrus**), Whin, or Furze (*Ulex*), Vetch (*Vicia*), Broom (*Genista*).

CLASS XVIII. POLYADELPHIA.

- ORDER. POLYANDRIA. St. John's, or St. Peter's Wort (*Hypericum**).

CLASS XIX. SYNGENESIA.

- ORDER. POLYGAMIA ÆQUALIS. Swine's Succory (*Hyoseris**), Goat's-beard (*Tragopogon*), Dandelion (*Leontodon*), Burdock (*Arctium*), Thistle (*Carduus*).

- POLYGAMIA SUPERFLUA. Groundsel (*Senecio**),
 Daisy (*Bellis*), Chamomile (*Anthemis*), Corn
 Marigold (*Chrysanthemum*).
 ———— POLYGAMIA FRUSTRANEA. Blue Bottle (*Centaurea**).
 ———— POLYGAMIA NECESSARIA. Marigold (*Calendula*).
 ———— POLYGAMIA SEGREGATA. Globe-Thistle (*Echi-*
nops).
 ———— MONOGAMIA. Gladiolus (*Lobelia**), Violet (*Viola*),
 Touch-me-not (*Impatiens*).

CLASS XX. GYNANDRIA.

- ORDER. DIANDRIA. Orchis (*Orchis**), Twayblade (*Ophrys*),
 Ladies-Slipper (*Cypripedium*).
 ———— HEXANDRIA. Birthwort (*Aristolochia**).
 ———— POLYANDRIA. Wake-Robin, or Cuckow-Pint
 (*Arum*).

CLASS XXI. MONOECIA.

- ORDER. MONANDRIA. Stonewort (*Chara**).
 ———— DIANDRIA. Duckmeat (*Nemna*).
 ———— TRIANDRIA. Seg, or Sedge (*Carex**), Cat's Tail
 (*Typha*), Bur-reed (*Sparganium*).
 ———— TETRANDRIA. Shoreweed (*Littorella**), Box (*Bux-*
us), Birch (*Betula*).
 ———— PENTANDRIA. Less Burdock (*Xanthium*).
 ———— POLYANDRIA. Millfoil (*Myriophyllum*), Arrow-head
 (*Sagittaria*).

CLASS XXII. DIOECIA.

- ORDER. DIANDRIA. Willow (*Salix**).
 ———— TRIANDRIA. Crane-berry (*Empetrum*).
 ———— TETRANDRIA. Mistletoe (*Viscum*).
 ———— PENTANDRIA. Hop (*Humulus*).
 ———— HEXANDRIA. Black Bryony (*Tamus*).
 ———— OCTANDRIA. Poplar (*Populus*), Rose-wort (*Rho-*
diola).
 ———— ENNEANDRIA. Mercury (*Mercurialis*), Frog-bit
 (*Hydrocharis*).

† Obs. There is no british genus, belonging to this Order.

~~MONADELPHIA.~~ Juniper (*Juniperus*), Yew (*Taxus*).

~~SYNGENESIA.~~ Butcher's Broom (*Ruscus**).

CLASS XXIII. POLYGAMIA.

ORDER. MONOECIA. Orache (*Atriplex**), Sycamore (*Acer**).

DIOECIA. Ash (*Fraxinus*).

TRIOECIA. Fig (*Ficus*), Carob Tree (*Ceratonia*.)†

After examining a sufficient number of these examples, the student may attempt to investigate the class and order of plants, that are unknown to him, beginning with those which have perfect flowers of a larger size, and paying attention to the following rules.

1. It is to be determined by inspecting a few flowers, whether these be perfect, or imperfect. If they have all stamens and pistils, the plant is to be considered as belonging to one of the first twenty classes; if they have only stamens, or pistils, or if some have only stamens, or pistils, and others have both, the plant is to be referred to one of the three subsequent classes.

2. Having ascertained the flowers to be perfect, the stamens are, in the next place, to be examined, and if these should be found all of equal length, not connected with each other, by their filaments, or anthers, nor inserted in the pistil, he may be assured that the plant belongs to one of the first thirteen classes. Should the stamens be fewer than twelve, the class is determined merely by counting them: But should the stamens be twelve, or more, besides counting them, it is necessary to determine whether they be inserted in the calyx, or receptacle: If they be from twelve to nineteen, and inserted in the latter, the plant is to be referred to the class Dodecandria: If they be about twenty, and inserted in the inside of the calyx, it is to be referred to Icosandria: If twenty, or more, and inserted in the receptacle, it is to be considered as belonging to Polyandria. Having determined to which of these classes the plant in question belongs, the order is to be determined by the number of the pistils: If this be only one, it belongs to Monogynia; if two, to Digynia, &c. &c.††

† This order contains only two genera, neither of which are natives of Britain. *Ceratonia* is a true polygamous genus; but *Ficus* cannot properly be so considered, since it wants hermaphrodite flowers, which are stated to be essential to this class. It is however trioicous, bearing males and females upon one, males only upon a second, and females only upon a third individual: And as there is no Class Trioecia, it is referred to this order of the class Polygamia.

†† See above, page xxi.

3. When the flowers are all perfect, and the stamens are four or six in number, and two of them constantly shorter than the rest, the plant may, without hesitation, be referred to the class Didynamia, if the stamens be four; and to Tetradynamia, if they be six.

If the plant be found to belong to the former class, the order is not to be determined by the number of the pistils, for the pistil is always single, but by observing whether the seeds are naked, or enclosed in a pericarp. Should there be four naked seeds in the bottom of the calyx, the plant is to be referred to the Order Gymnospermia; And should the seeds be contained in a seed-vessel, it must be considered, as belonging to the Order Angiospermia.

Should the plant in question be found to belong to the Class Tetradynamia, the Order is to be determined by the form of the pericarp. If this be a *Silicle*, it is to be referred to the first Order Siliculosa; if a *Siliqua*, to the second Order Siliquosa.

4. If all the flowers be perfect, and the stamens be found connected by their filaments into one body, brotherhood, or set, the plant is to be referred to the Class Monadelphia; If they be in two sets, it is to be referred to Diadelphia; And if in three or more sets, it belongs to the Class Polyadelphia.

In all these classes, the orders, being established solely on the number of the stamens, are ascertained without difficulty. See page xxii.

5. When, in perfect flowers, the anthers are observed to be united into one cylindrical tube, the plant is to be considered, as belonging to the Class Syngenesia. And the order is to be determined from the sex and disposition of the florets, as explained above, in page xxii.

6. The plant is to be referred to the Class Gynandria, when the stamens are inserted in the pistil. And, in some instances, plants are placed in this class by Linnaeus, which have an elongated receptacle like a style, and the stamens and pistils inserted in it. But it would be more proper, and more conformable to the principles of his system, to remove these plants to the other classes. The Orders of this Class are determined by the number of the stamens. See page xxiii.

7. When imperfect flowers only are found upon a plant, it is to be referred to the Class Monoecia, if it be androgynous, or bear both male or female flowers; and to Dioecia, when the male, or stamiferous flowers are upon one individual, and the female, or pistilliferous flowers upon another.

The Orders are determined from the number, or connection of the stamens, as explained in page xxiii of this introduction.

8. If both perfect, and imperfect flowers occur on the same plant, or on two, or three, different plants of the same species, and be neither inclosed within the same common calyx, nor situated on the same common receptacle,† the plant is to be referred to the 23d Class (Polygamia). Should the hermaphrodite, or the male, or female plant occur singly to the reader, it may be supposed that considerable difficulty will attend the determination of this Class. But we have only one example amongst all the indigenous, or native plants of this Island, in which the imperfect, and perfect flowers are found on distinct individuals, and this is a well known tree, the *Common Ash*; so that the british student will meet with no embarrassment from this source, unless he be induced to investigate exotics.

Nor will much difficulty attend the determination of the Orders; for, if we find imperfect, and perfect flowers on the same individual, we may refer the plant, without hesitation, to the Order Monoecia: If they be on two distinct individuals, the plant is to be referred to the Order Dioecia, as in the example of the *Common Ash*. And, if they occur on three distinct individuals, the plant belongs to the Order Trioecia.

Finally, Should a difficulty occur, in ascertaining the number of the stamens, and pistils, from this being different in different flowers of the same plant, it will be necessary to examine two or three flowers that are not yet expanded, as, in these, none of the stamens, or pistils, can have been lost. And, if the same difference, with respect to number, exist in these flowers, the preference is to be given to the terminating flower, in determining the Class and Order: In *Moschatel (Adoxa)*, for example, the lateral flowers have ten stamens and five pistils, but the terminal flower has only eight stamens, and four pistils, and hence the plant is referred to Octandria Tetragynia by Linnæus.

On account of the necessity of having a perfect knowledge of the classes and orders, it has been thought proper to dwell long upon the consideration of them. Too great attention, indeed, can hardly be paid to the investigation of these two superior divisions, for if we commit an error in determining either the Class, or Order, a great deal of unnecessary trouble will be experienced in the subsequent investigation of the genus; since, after comparing our flower with every generic character, contained in the Class and Order, to which we had wrongly referred it, we shall

† If these circumstances be not attended to, many plants, bearing compound, and umbellate flowers, may be referred to Polygamia, which are placed by Linnæus in the Classes Pentandria, and Syngenesia.

find ourselves obliged to begin again to investigate the order, if not both.†

To understand the characters of the classes and orders, few terms are necessary to be known: but, before the generic characters can be comprehended, a knowledge of the numerous terms, applied to the seven parts of fructification in consequence of their different modifications, arising from number, figure, situation, and proportion, is required. The reader, therefore, before he proceeds further, should peruse carefully once or twice the Botanical Terms and Definitions, included betwixt No. 541 and 1145, and consult the plates, given in the end of this volume, for those which are illustrated by figures: But it is advisable not to spend too much time in studying these, before he begins to attend to the genera, since the terms are more easily understood, and better remembered by making the application of them to the parts of fructification of a plant, placed before him. Whenever a term occurs, which he does not perfectly understand, he should never omit consulting the Dictionary, or Botanical Terms, and, in doing this, he ought to be particularly attentive to this circumstance, that the same term has sometimes a different signification, when applied to different parts; for example, *very short* (*brevissima*) applied to the corol implies that it is *not as long as the calyx*; applied to the filaments, it signifies that these are *much shorter than the corol*; hence, if he be desirous to know the meaning of a term, applied to the corol, he ought to look for the definition of it, when it is so used.

It may be proper to observe here, that many compound terms are neither to be found amongst the Botanical Terms, as given in the Delineation of a Plant, nor in the Dictionary. These it was judged unnecessary to insert, because they are to be understood as participating of the two simple terms, and rather more of that, which is placed first, thus *ovato-lanceolate* applied to a leaf, or petal, implies that the leaf, or petal, is of a form betwixt ovate and lanceolate, but more inclined to ovate.

† The reducing of a plant to its Class, Order, Genus, Species and Variety, has been compared with the method, employed to find a word in a Dictionary. To find the word Plant, for example, the P is first to be sought for, after that the L, and successively the A, N, and T. The P represents the Class, the L the Order, the A the Genus, the N the Species, and the T the Variety. In this search, if we mistake either of the two first letters, it is evident that a good deal of unnecessary trouble will be the consequence.

III. OF THE GENERA.

The Genera are the third subdivisions in the Sexual System, and are extremely numerous: No fewer than 1769 are described in the last edition of the *Genera Plantarum* by Schreber.

The great advantage, derived from giving to the classes and orders such names as are expressive of the whole, or of the leading circumstances, of their characters, must be obvious to every one; since the names, and characters serve reciprocally to suggest each other: But, however desirable it may be to have a complete nomenclature for the genera, established upon the same principle, their extensive number renders this absolutely impracticable. In some, though comparatively few instances, the names of the genera do exhibit the essential character, or the habit of plants, and these are declared to be the best by Linnæus, who has been very laudably employed in delivering rules for the formation of generic names, and in reforming the old ones, conformably to these rules.† Yet the greater part is either taken from the qualities, and uses of plants, or perfectly arbitrary. Many of the latter kind are derived from the names of eminent men, especially botanists.

Many of the latin names, employed by Linnæus, are become naturalized in England, as *Crocus*, *Convolvulus*, *Geranium*, &c. &c., and it is very much to be wished, that they were adopted in every instance; for the english generic names were in use long before the sexual system was invented, and therefore very rarely correspond exactly with those adopted by the author of it; some being more comprehensive, as *Vetch*, *Hemlock*, &c, and others being less extensive, as *Sage*, *Wormwood*, &c. It is on this account, that the english names are never added to the Linnean names of the genera in the second volume: And they are given in an Index, merely to assist the student in learning to investigate, by enabling him to find the genera, to which the plants, known to him, only by their english names, belong.

The Characters of the genera are constructed entirely from the parts of fructification, and are of three kinds, as enumerated, and defined by Linnæus, namely, *Natural*, *Essential*, and *Factitious*.

1. The *Natural* Character is taken from the number, figure, situation, and proportion of all the seven parts of fructification. It includes the marks, from which the *Essential*, and *Factitious* characters are formed; is applicable to every system, that has been, or ever will be established on the fructification as a basis; and it does not require to be changed, whatever new genera may be

† See *Philosophia and Critica Botanica*.

discovered, which is not the case with the other two. The natural character of *Prunella* (*Selfheal*) is here subjoined as an example.

PRUNELLA. *Tourn.* 84. *Curtis.*†

CALYX. *Perianth* one-leaved, two-lipped, shorter than the throat, persisting. *Upper lip* flat, broader, truncated, slightly three-toothed. *Lower lip* erect, narrower, acute, half two-cleft.

COROL one-petalled, ringent. *Tube* short, cylindrical. *Throat* oblong. *Upper lip* concave, entire, nodding. *Lower lip* reflected, three-cleft, obtuse, middle segment broader, emarginate, serrated.

STAMENS. *Filaments* four, subulate, two-forked at the apex, two of them a little longer. *Anthers* simple, inserted on the filaments, below the summits, as if upon another branch.

PISTIL. *Germen* four-parted. *Style* filiform, inclined with the stamens to the upper lip. *Stigma* bifid.

PERICARP none. *Calyx* closed, containing the seeds.

SEEDS four, somewhat ovate.

2. The *Essential* Character exhibits the best adapted single mark of the genus, to which it is applied. It is recommended by its certainty, as well as brevity; for it serves to discriminate the genus from every other, belonging to the same natural, as well as artificial order. As an example, the essential character of the same genus, *Prunella*, is added.

PRUNELLA. *Filaments* all two-forked at the top.

It is much to be wished, that such essential characters could be formed for every genus.

3. The *Factitious* Character serves to distinguish a genus from all the other genera, belonging to the same artificial order only, and consists of as many marks, as are requisite for this purpose, and no more.

In the second volume, at the beginning of each class, is given a *Synoptical Table*, containing the abbreviated characters of all the genera, belonging to it. Of these some are truly, and strictly, essential characters, others are factitious, or artificial: But, since it is usual to consider them all as essential ones, they will all be called by this title, in future, throughout this introduction.

Many of the Orders, in these synoptical tables, are subdivided into two, or more sections, comprehending the genera, that agree with each other in one, or more characteristic marks.

† *Tournefort* and *Curtis* are added after *Prunella* to shew that the genus is figured by these two authors.

These sections, though they are only occasionally introduced, and therefore do not constitute one of the regular and essential divisions of the system, are found to be of material use in facilitating the investigation of the generic character; for, by ascertaining the section, to which the plant under examination is referred, instead of having it to compare with the characters of all the genera, contained in an extensive order, we shall have to examine only two, or three, or a comparatively small number.

The same plan is to be pursued in learning to investigate the genera, as has been pointed out, with respect to the Classes and Orders. The Student should first take some of the plants, put down as examples of the Classes and Orders, and known to him by name and sight, and compare their parts of fructification with the essential and natural generic characters, given in the second volume, till he has acquired a tolerable facility in making the application of those terms, which he has last studied. He may then begin to investigate, as far as the genus is concerned, any unknown plant, which occurs to him, paying attention to the following *Rules*.

1. In collecting specimens care should be taken not only to have both unopened, and expanded flowers, but likewise to have the fruit in an advanced state; since the fruit always constitutes a very important part of the natural, and frequently of the essential character. It is advisable also to have the whole inflorescence, as it will occasionally assist in determining the subdivision of the order.

2. Having determined the class and order, agreeably to the rules delivered in page xxxi, the synoptical table of the genera is to be examined, and if the order contain no sections, we must proceed immediately to compare our specimen with the essential characters: If the order be subdivided, we must first ascertain to which of the sections it belongs, and then begin to compare it with the generic characters, contained in this section, till we have found one, with which it appears to correspond.

3. The fructification is, in the next place, to be carefully compared with the natural generic character, and if it agree exactly with this likewise, the genus may be considered as ascertained beyond a doubt.

4. If none of the essential characters correspond with the fructification of the plant under examination, the essential and natural characters of those genera, which are printed in Italics, and included in a Parenthesis, are to be compared with it, and the observations, subjoined to these, are to be attended to. In this way the genus will frequently be discovered, when it could not otherwise have been made out.

5. Should any doubts still remain, some of the figures, that are referred to, may be consulted: But these should not be resorted to upon every appearance of difficulty; for some hours, spent in an unsuccessful investigation, are by no means misemployed.

The method of applying these rules is explained in the following examples.

EXAMPLE I.

INCHANTER'S NIGHT SHADE.

By inspecting the flowers of a plant belonging to this genus, and observing in each of them two stamens and one pistil, we very easily ascertain the Class and Order to be Diandria Monogynia. We then turn to the synopsis, placed in the beginning of the second class (Vol. II. p. 3.), and there find that the Order Monogynia has three Sections, with the annexed titles;

1. *Flowers inferior, one-petalled, regular.*
2. *Flowers inferior, one-petalled, irregular.*
3. *Flowers superior.*

To ascertain to which of these sections our plant belongs, we attend to the situation of the corol, and finding it superior to, or placed above the germen,† soon perceive that it is to be referred to the third. In this section there is only one genus, *CIRCEA*; of which the following essential character is given "*Calyx* two-leaved. *Corol* two-petalled. *Petals* obcordate." The flowers of our specimen, agreeing very well with this, we next examine the natural character (given in the same volume, page 6), and by comparing the calyx, corol, stamens, pistil, pericarp, and seeds successively with the full description, there delivered; and finding them to correspond in every respect, we can not entertain the least doubt, but this is the genus to which our plant belongs.

EXAMPLE II. BUTTERWORT.

Having determined, without difficulty, that the plant, before us, ought to be referred to the same class and order as the preceding, we begin to compare it with the titles of the three sections, and, observing that the flowers consist of one irregular petal, which is inferior to, or placed beneath the germen, we believe that it belongs to the second section. In this section there are two sub-

† Since the germen passes into the fruit, it is evident, that a superior flower and an inferior fruit have the same signification, and *vice versa*.

divisions. A. Fruit capsular. B. Seeds naked. We therefore attend to the fruit, and, finding the seeds enclosed in a capsule, consider our specimen as belonging to the former, which contains three genera, *Veronica*, *Pinguicula*, and *Utricularia*.

By comparing the flowers with the essential characters of these three genera, we very soon perceive, that they accord exactly with *Pinguicula*, since the *Corol* is ringent, and furnished with a nectary in the form of a spur, and the *Calyx* is five-cleft. We now turn to the natural character, and have the satisfaction to find that it agrees in every respect with the fructification of our specimen: Whence we conclude, that we are right in referring it to the genus *Pinguicula*.

EXAMPLE III. BUCKBEAN.

Should a specimen of this beautiful plant occur to us, we soon perceive, that it is to be referred to the Class Pentandria, and Order Monogynia, each flower having five stamens and one pistil. This Order is extensive, and has seven sections. Of these the first comprehends all the genera, that have *inferior flowers, with one petal, and four seeds or nuts*: The second contains those, having *one-petalled inferior flowers, and their seeds in a vessel*. The fructification of our specimen agreeing with the second section, we begin to compare it with the essential characters of the genera, placed in this section, and soon discover that it corresponds with *MENYANTHES* in having a one-celled † *Capsule*, a villous *Corol*, and a bifid *Stigma*. Therefore, without examining any more of the generic characters, we turn to the natural character, and are thence fully confirmed in our opinion, that we have ascertained the genus.

EXAMPLE IV. COMMON HEMLOCK.

The inflorescence of this plant shews it to be an *Umbellate* one, and the five stamens and two pistils, found in each flower, induce us to refer it to the Class and Order Pentandria Digynia. In this order, which contains a great number of genera, there are four sections, and the fourth is thus characterized, *Flowers five-petalled, superior, two-seeded*. UMBELLATE. We may therefore be certain that the plant ought to be referred to this section, which has the following subdivisions,

† To determine the number of cells in a capsule, or other pericarp, we should divide it horizontally with a sharp knife, and remove the seeds very carefully so as not to injure the dissepiments.

A. Involucres universal and partial.

B. Involucres partial only.

C. Involucres none.

By attending to the involucres, we discover that our specimen has both kinds, and, of course, belongs to the first subdivision. We then compare it with the essential characters of the genera, placed in this subdivision, and, finding it to agree in every circumstance with *Conium*, we examine the natural character of this genus, with which it likewise corresponds exactly, and hence we have every reason to believe that *Conium* is the genus, to which it ought to be referred:

With respect to the *Umbellate* plants, it is proper to be observed: 1st. That they all belong to the same class and order. 2dly. That the seeds are deserving of particular attention, since they often afford better distinctive marks than the flowers; and 3dly. That the universal involucres are sometimes altogether wanting, in some specimens of the genera, referred to the first subdivision, or fall off very early. Hence it is proper to attend to several of the Umbels, especially those which have their flowers unexpanded: And if we have been induced, in consequence of the absence of the universal involucre, to consider our plant, as belonging to the second subdivision; after comparing it with the characters of the genera contained therein, and finding, that it does not agree with any of them, we must next examine the characters of those genera, that are included within crotchets at the end of this subdivision, till we find one with which it corresponds.

EXAMPLE V. RED VALERIAN.

From inspecting several flowers of our specimen, and observing, in each of them, one stamen and one pistil, we are induced to consider it as belonging to Monandria Monogynia, and to compare it with the essential characters of the genera, placed in this class and order. But finding that these do not at all agree with the fructification of our plant, we direct our attention to the genera, included within crotchets. The first, which occurs, is *Valeriana*. We examine the essential and natural characters of this genus, and from comparing these with the flowers of our specimen, and reading the observations subjoined to the latter, we are convinced, that *Valeriana* must be the genus, to which our plant is referred by Linnæus.

EX.VI. RED-FLOWERED CAMPION.

This species being extremely common, and its flowers very conspicuous, it cannot fail to attract our attention, and to become an

early object of our investigation. Having procured several specimens of it, and finding in all the flowers of one plant ten stamens and no pistils, and in all those of another plant five pistils and no stamens, we conclude that it must belong to the Class Dioecia. Not recollecting exactly on what circumstances the Orders are established in this class, we turn to the Synoptical Table, and discover that they are taken from the number or connection of the stamens. The plant in question has ten stamens, and hence we suppose it to belong to the order Decandria, which, to our great surprize, does not contain one British genus: But observing the names of two genera *Cucubalus* and *Lychnis*, included between crotchets, we first examine the character of *Cucubalus*, and finding that it has only three pistils, we pass on to the natural character of *Lychnis*, which, we shall find, agrees with our specimens in having five pistils, and in every respect, except that it is not a dioicous genus. The Observations, subjoined to the character, being next attended to, every difficulty vanishes, for we there find, that in *Lychnis Dioica* the male and female flowers are on distinct plants. Hence we can no longer have any doubt respecting the genus.

Had we only met with a male, or female plant, we should have considered it as belonging to the class Dioecia, but could not well have proceeded further in the investigation, till we had found a plant of the other sex.

The reader will very probably be of opinion, that the species of *Lychnis* with male and female flowers on distinct plants, should have been referred to a different genus, and likewise that the species of *Valeriana*, which we have just examined, ought not to have been placed in the same genus with those having three stamens. But the illustrious author of the Sexual System, ever desirous of forming natural genera, was induced to prefer arranging under the same genus, species differing in some of the parts of fructification, provided they agree in other essential characteristic marks.† He has likewise extended this practice to the Class Diadelphia, for, unwilling to separate genera, evidently belonging to the same natural order, he has retained in the above mentioned Class several

† In some genera one part, in others another part of the fructification is found to be more constant than the rest: but there is not any, which is absolutely constant.

The PERICARP is different in the species, belonging to the same genus, in *Impatiens*, *Campanula*, *Primula*, *Fumaria*, &c.

The CALYX, in *Nymphaea*, and *Cornus*.

The COROL, in *Vaccinium*, *Convallaria*, &c.

The STAMENS, in *Corispermum*, and *Valeriana*.

The SEEDS in *Ranunculus*, and *Alisma*.

See PHIL. BOT. § 175.

genera, which, conformably to his definition of Monadelphia, ought to have been referred to it; since the stamens are united in one set, or brotherhood. These deviations from the principles of the system, would have presented very great obstacles in the practice of Botany, if the expedient of placing the exceptions between brackets in each Order, or section of an order, had not been resorted to. Whereas by these means little more difficulty, or inconvenience, occurs in the investigation than if the genera had been divided, and the species, differing from the rest in sex, or the number of their stamens and pistils, had been referred to distinct genera, and arranged in those Classes, and Orders, to which they would then have properly belonged. It is deemed superfluous to adduce any further examples. Yet it is extremely proper, that the student should confine himself to the investigation of the genera, till he has acquired a tolerable facility of determining them. He may then prepare for the investigation of the species and varieties, the great end to which all botanical science is directed.

IV. OF THE SPECIES.

The Species are as numerous as the distinct invariable forms of plants, or vegetables, originally created, and now existing.

In some genera we have only one or two species; in most there are several; and in some they are extremely numerous, fifty, a hundred, or more.

A species is completely denominated, when in addition to the generic, or family name, it has another, which is commonly styled indiscriminately the *specific* or *trivial* name, although Linnaeus makes a distinction between the two.

Two kinds of Characters are allotted to the Species, as well as the Genera, the *essential*, and the *natural*.

According to Linnaeus (See *Philosophia Botanica* § 256. &c.) a legitimate *specific* name distinguishes a plant from all its congeners. It contains the essential mark, or marks of the species; and is what is now considered as the essential, or specific character. A *trivial* name, in almost every instance, consists of only one word, and is not subjected to any laws, but may be taken, without reserve, from circumstances, that are inadmissible in the specific name. It sometimes is expressive of a characteristic mark, in other cases it is a rejected generic name, or is taken from the soil, place of growth, qualities of plants, &c. &c. The trivial names were first introduced by Linnaeus in the *Pan Sucus*, and afterwards employed in the *Species Plantarum*. From their brevity, and not being liable to be changed on the discovery of new species, they are found to be very convenient. It is hardly necessary to say that those are the best, which exhibit an abridgement of the specific name, or character.

1. The *Essential*, or, as it is generally named, the *Specific* character consists of as many characteristic marks, as are sufficient for distinguishing one species from every other, referred to the same genus.

2. The *Natural* character, or, as it is generally termed, the *Description* of the species, commences with the root, and delivers in succession all the constant, and invariable marks of the different parts of the plant. It is frequently subjoined to the specific character, especially when there is any unusual difficulty in ascertaining the species.

The specific characters are sometimes taken from some invariable circumstances of the parts of fructification, not noticed in the generic character, and wherein the species of the same genus disagree: But they are more frequently taken from the form, and other circumstances, of the *Root, Trunk, Leaves, Fulcrs, Hybernacles, and Inflorescence*. Hence, previously to entering upon the investigation of the species, a careful perusal of the terms and definitions, applicable to these different parts, included in No. 1—541, and a comparison of them with the figures, given for their illustration, become proper and necessary, and also an attention to the two following rules.

1. In collecting specimens, the smaller branches of Trees and Shrubs are all that is necessary: But, as the root furnishes a material, and even an indispensable part of the specific character of some herbaceous plants, it is necessary to take up these by the roots. Where this part is not wanted, the root-leaves are frequently necessary; and the lowest leaves of the stem are almost always to be taken, since these are the least liable to vary, and are, on this account, most attended to, in constructing specific characters, when the contrary is not mentioned.

2dly. Whenever a genus is subdivided, which is generally the case, where the species are numerous, the particular subdivision, to which the plant belongs, is to be determined (as has been recommended with respect to the sections of the orders), before we begin to compare the specific characters with it.

We shall now put down a few examples by way of illustrating the method of investigating the species; premising that, as the specific characters are not contained in these volumes, it becomes necessary to consult some other book, and that the one, here referred to, is the *BRITISH FLORA*, which may be considered as a continuation of this work.

EX. I. COMMON BUTTERWORT.

Having ascertained that our plant belongs to the genus *Pinguicula*, in the manner explained above, we look for this genus

in the British Flora, and, finding that it has no subdivisions, immediately begin to compare our specimen with the characters of the two species comprehended by it, which are thus given in page 5th.

lusitánica. 1. P. Nectary thickest at the end. (Nectary obtuse, shorter than the petal, scape hairy, capsule globular. E. Bot.) *P. villosa*. Lightf. tab. 6.

— Marshes, P. 6. 7. E. Bot. 145.

vulgáris. 2. P. Nectary cylindrical, as long as the petal. (Capsule ovate. E. Bot.)

Common Butterwort. Bogs. P. 5. 6. E. Bot. 70.

We very soon discover, that it exactly corresponds with the latter species *Pinguicula vulgaris*. Should we however have the least doubt remaining, we may consult the 70th plate of English Botany, for further satisfaction. This is an instance of a specific character, taken from the parts of fructification.

EX. II. COMMON SPEEDWELL.

Having successively ascertained the Class, Order, and Genus, to which our plant belongs, we turn to page fourth of the British Flora, and there find that *VERONICA* has seventeen species, arranged under three subdivisions founded on the inflorescence, namely,

1. *Spiked*. Species 3.
2. *Corymboso-racemous*.† Species 9.
3. *Peduncles one-flowered*. Species 5.

We immediately perceive, that the flowers of our specimen are in spikes, and begin to compare it with the characters of the three species in this division. It disagrees with the two former in not having *terminal* spikes, &c., and perfectly corresponds with the third, in having lateral spikes, opposite leaves, and a procumbent stem. We are hence led to consider it as of this species, namely, *Veronica officinalis*.

The lateral spikes in some specimens arise so near the end, or top of the plant, that, without considerable attention, we shall be in danger of mistaking them for terminal ones.

In this example a principal part of the specific character is formed from the inflorescence.

† Bearing the flowers in a corymb, or raceme. This is an instance of a compound term used in a different sense from that mentioned above in page xxxiv.

EX. III. WHITE SAXIFRAGE.

After ascertaining that our plant belongs to the genus *SAXIFRAGA*, we turn to the 92d page of the British Flora, and discover that the species are thirteen, and arranged in three subdivisions, formed from the leaves and stem, viz.

1. *Leaves undivided, stem almost naked.* Species 3.
2. *Leaves undivided, stem leafy.* Species 3.
3. *Leaves lobed, stems erect.* Species 7.

Since the leaves of our specimen are divided into lobes, we compare it with the specific characters of the third subdivision, and are soon convinced, that it is to be referred to the first species, *S. granulata*, which is thus characterized "Stem-leaves reniform, lobed, stem branched, root granulated."

Had we, in this instance, neglected to take up the plant by the root, we might have remained in some doubt as to the species, till we could have provided ourselves with a more perfect specimen, or have consulted a figure of it.—The subdivisions of the genera are sometimes established on the different form of the root, as in *Orchis* and *Ophrys*.

EX. IV. CLOWN'S ALL-HEAL.

We first ascertain that the plant, under examination, belongs to the Class *Didynamia*, because it has four stamens, two of which are constantly longer than the others, and one pistil in each flower. We afterwards determine, that it is to be referred to the Order *Gymnospermia*, on account of its naked seeds; and to the genus *STACHYS*, because it has the lower lip of the corol reflected at the sides, and the stamens diverging, and turned to the sides of the corol, after emitting their pollen.

In the British Flora, page 132, we observe that this genus has four species, but no subdivisions, and we therefore immediately begin to compare our specimen with the specific characters. It agrees so exactly with the second in its verticils and leaves, that we are very soon convinced it must belong to the species *S. palustris*.

EXAMPLE V. TUFTED VETCH.

From the flowers being hermaphrodite, and the ten stamens united into two sets (nine and one), we have no difficulty in ascertaining, that this plant is to be referred to *Diadelphia Decandria*. We next determine the genus to be *Vicia*, and turning to

the British Flora, page 161, find the species, included under it, to be eight, and arranged in two subdivisions. In the first of these subdivisions the Peduncles are elongated, and many-flowered. Our specimen agreeing with this title, we compare it with the characters of the two species *V. sylvatica* and *Cracca*, and very easily determine that it ought to be referred to the latter.

EXAMPLE VI. COW QUAKES.

This is a very beautiful grass, and has obtained the name of Quakes, or Quake-grass, from its spikelets being very easily put in motion. All the British Grasses, except *Anthoxanthum odoratum* (Spring-Grass), which belongs to *Diandria Digynia*, and *Holcus lanatus*, and *mollis* (Meadow and Creeping Soft Grass), which are placed in the Class *Polygamia*, Order *Monoecia*, are referred to *Triandria Digynia*.

If the flowers of the grasses be examined, when they are in a proper state, just before the anthers shed their pollen, the glumes are opened, and their stamens and pistils are sufficiently evident, especially if a glass be used, to enable us to determine the class and order without difficulty.

Having determined the genus of our plant to be *BRIZA*, by comparing it first with the titles of the sections, and afterwards with the generic characters, contained in the third section, we turn to the British Flora, p. 23, and find that it comprehends only three species. With the second of these our plant agrees very well, and we pronounce it to be *Briza media*.

EXAMPLE VII. STALKED ORACHE.

There is such a remarkable difference in the flowers of our plant, that we are, on the first view, led to believe them to be of different sexes. From examining a few flowers of each kind, we find that some are hermaphrodite, and others female, and therefore, without hesitation, refer it to the class *Polygamia*; and, we begin to compare our specimen with the characters of the genera contained in the Order *Monoecia*. Having determined that it belongs to the genus *ATRIPLEX*, we turn to the British Flora, and, by carefully attending to the characters of the six species comprehended by this genus, we satisfy ourselves that it must be the *A. pedunculata*.

Judging the above examples to be fully sufficient for explaining the method of investigating the species, we next proceed to consider the Varieties, or lowest subdivisions of the Linnean System.

V. OF THE VARIETIES.

Every part of a plant is liable to *Variation* from the influence of *accidental* causes, as *Climate, Soil, Exposure, Heat, Cold, Winds, Culture, Diseases and Injuries*. And plants, thus changed, are named *VARIETIES*. The varieties have, in some instances, distinct names; in others they are distinguished only by numbers, or the greek letters α . β . &c.

The parts, most susceptible of variation, are the *Leaves* and *Corol*.

The *LEAVES* are found to vary in their colour, magnitude, pubescence, and other circumstances.

The *COROL* is still more liable to vary in colour than the leaves. It is sometimes entirely wanting; and, on other occasions, is observed to be of a larger size, or to consist of a greater number of petals than natural. When the petals are increased in number, and the stamens are present, the corol is said to be *double*, or *multiplied*, according to the number of series of the petals. When the number of the petals is increased to such a degree; that the stamens are excluded, the corol is said to be *full*. In the latter case, the flowers are unfit for investigation, and we should not be able to determine, to what genus and species the plant ought to be referred, unless we were previously acquainted with it, in its natural state. In the former case the same difficulty does not occur, since we can determine the number of petals from the outermost series, which is perfectly constant.

For the variations, which occur in the other parts of a plant, the reader is referred to the Botanical Terms, No. 1184—1195.

Since these variations are not essential, and permanent, it would be obviously improper to consider the Varieties, as distinct species. For, although some of them retain their peculiarities, when transplanted, or when propagated by slips, the young plants raised from their seeds, invariably return to their original state. And hence Culture presents the best, and indeed only means of ascertaining exactly, whether a plant be a new species, or merely a variety of one already described.

In consequence of these accidental changes, especially the more remarkable ones, Botanists sometimes subdivide the species into Varieties. In these cases, after determining the species, it becomes necessary to proceed a step further in our investigation, and to ascertain the variety, to which our plant should be referred. It will be sufficient to adduce a single example by way of illustration.

AMPHIBIOUS SNAKEWEED.

Having ascertained, according to the rules delivered above, that our plant ought to be referred to *Polygonum amphibium*, we observe that this species includes two varieties, which are thus characterized in the British Flora (page 85).

Var. 1. *aquaticum*. Stem creeping, leaves floating, oblongo-lanceolate, shining, stamens shorter than the corol.

— 2. *terrestre*. Stem erect, leaves acuminate, rough, stamens longer than, or as long as the corol.

We therefore compare our specimen with these characters, and easily determine to which of them it belongs.

Although these two varieties differ very materially from each other, they cannot, with propriety, be considered as constituting two different species, the diversity of appearance being evidently owing to the place of growth. For, if a plant of this species grow in the water, it invariably assumes the appearance of the first variety; if on land, it as constantly takes that of the latter; and if at the edge of the water so that part of the plant is in the water, and part of it out of the water, it exhibits, in some degree, the characters of both.

VI. OF THE CLASS CRYPTOGRAMIA.

After the student has acquired a tolerable facility of investigating the plants with conspicuous stamens, and pistils, he may prepare for the examination of those, which are arranged under the Class Cryptogamia.

This Class derives its name from two greek words, signifying *concealed nuptials*, and comprehends all those Vegetables, in which the fructification is concealed within the fruit, or in some particular manner, and the sexual organs are too minute to be discernible by the naked eye, or still undiscovered.

The Cryptogamous Vegetables differ very materially, in their general structure, and appearance, from those contained in the preceding classes. They are divided into four Orders, each constituting one of the great *Families*, or *Nations*, into which Linnaeus has distributed the Vegetable Kingdom. These are

1. **FILICES**, plants bearing their fructifications in spikes; or in *dots*, *lines*, &c., on the back or margin of their leaves; or at the root. See Plate IX. fig. 24. A. and Vol. II. Pl. III. Div. 24. A.

2. **MUSCI**, plants having *Capsules* envelopped in a *Calyptre*, and reticulated membranous leaves, which, after being dried, are revived by the application of water. See Plate IX. fig. 24. B, and Vol. II. Pl. III. Div. 24. B.
3. **ALGÆ**, plants of a gelatinous, membranous, coriaceous, filamentous, or crustaceous substance, and, for the most part, having no distinct root, leaves, or stem. The *fructifications* are various, as *capsules*, *tubercles*, &c. See Plate IX. fig. 24. C, and Vol. II. Pl. III. Div. 24. C.
4. **FUNGI**, plants generally of a fleshy, or cork-like substance, and of short duration. The *fructifications* disposed in gills, tubes, &c. See Plate IX. fig. 24. D, and Vol. II. Plate III. Div. 24. D.†

The method to be pursued in the investigation of the plants, belonging to this Class, is not materially different, from that employed in the preceding Classes.

1. We determine the Class from the peculiarity of consistence, or structure of the plants, and the absence of perceptible sexual organs.

2. The Orders are to be determined partly from the structure, and consistence of the plants, and partly from the form, situation, and disposition of their fructifications, according to the definitions delivered above. But it must be acknowledged, that we cannot investigate the orders so satisfactorily as might be wished, their characters, especially those of the *Algæ* and *Fungi*, not being exactly defined.

3. Having determined the Class, Order, and Section, we are to compare our plants, in the next place, with the characters of the genera, and afterwards with those of the species and varieties, till we have satisfied ourselves as to these; having recourse in all doubtful cases to the figures referred to, which are more frequently necessary, and therefore more properly indulged in here than in the former classes.

A few explanatory examples are added:

EXAMP. I. WOOD HORSE-TAIL.

This plant appears early in the spring, and is very common in moist shady places. It has both fertile and barren fronds, and has

† The characters of the Orders, given in this place, are somewhat different from those given by Linnæus. See Botanical Terms, &c., page 62, and the Introduction to the 24th Class in Vol. II. page 257.

its fructifications in a terminal spike, without evident stamens or pistils. We therefore, without much difficulty, determine the Class and Order. Turning to the synoptical table, we find the *Filices* divided into three sections thus characterized.

1. Fructifications in Spikes.
2. Fructifications frondose, on the under surface or margin of the frond, disposed in dots, lines, &c.
3. Fructifications at the root, or very near it.

And we immediately refer our specimen to the first Section, which contains only four genera. The essential character of the first genus, *EQUISETUM*, appearing to correspond very well, we examine the natural character, and from this, and a view of the figure, given in Vol. II. Pl. III. Div. 24. A., we are satisfied that we have ascertained the genus. We now turn to page 233 of the British Flora, and, by comparing our plant with the species of *Equisetum*, very soon discover that it belongs to the first, namely, *E. sylvaticum*. Should however any doubt remain, we may, for further satisfaction, consult the figure given in Bolton's *Filices Britannicæ*.

EXAMP. II. COMMON POLYPODY.

This is a very common plant, and is found growing at the roots of trees, &c. The Fructifications being on the back of the leaf, we easily determine the Order to be *Filices*, and turning to the synoptical table, we find that it belongs to the second section. We compare it with the generic characters, inserted therein, and conclude that it is a *POLYPODIUM*. We, in the next place, turn to the 256th page of the British Flora, and, finding the genus to have five subdivisions, and that our specimen agrees with the title of the first, we begin to compare it with the specific characters, and pronounce it to be the first species *P. vulgare*, and the first variety.

EXAMP. III. COMMON HAIR-MOSS.

We shall experience no difficulty in determining this plant to belong to the second Order Musci. Turning to the synopsis, we find this order divided into three sections, and, by comparing our specimen with the generic characters, contained in the second, we soon are satisfied that it is a *POLYTRICHUM*, from the hairy Calyptra, and the capsule's being placed on a small, margined apophysis. To ascertain the species we consult the British Flora, page 47, and finding the first division of the genus to be thus cha-

characterized, *Calyptrae* double, outer villous, hairs pointing downwards, we are induced to refer our plant to it. This division is subdivided in the following manner. A. Stemless. B. Stem simple. C. Stem branched. We look for our plant in the second subdivision, and from the leaves, and, the quadrangular form of the capsule, soon determine it to be *P. commune*. A comparison of our plant with the plant figured by Dillenius, plate 54. 1. convinces us that we are right.

It is here to be remarked that the generic characters of the *Musci* are, by Hedwig and Schreber, established principally on the peristome of the capsule, and the situation and form of the male flowers. The generic characters, as formed by Hedwig, are given in pages 76—82 of this volume, and those, adopted by Schreber, in volume second, p. 274—278. Those, who are desirous of investigating the *Musci*, according to either of these methods, will find it necessary to study the terms, and definitions given in P. 64—75.

EXAMPLE IV.

ASH-COLOURED GROUND LIVERWORT.

From the absence of evident stamens, and pistils, we conclude that this plant belongs to the Class Cryptogamia, and, from its appearance and coriaceous texture, that it ought to be referred to the Order Algæ. We turn to the synoptical table, and compare it with the essential characters of the genera in the first section, and conclude, from its fructification's resembling a shield, that it must be a LICHEN. Turning to the British Flora, page 284, we find that the species of this genus are very numerous, and arranged under ten divisions, one of which (the 5th) comprehends those, that are coriaceous or leather-like. We therefore begin to examine the species in this subdivision, and find that the character of *L. caninus* corresponds very well with our plant in every respect, and by consulting the plate referred to, in Dillenius's admirable work, we are convinced, that we have referred it to the proper species.

EXAMP. V. COMMON MUSHROOM.

From the absence of evident stamens, and pistils, we refer this very common vegetable to the class under consideration; and, from its fleshy consistence, we have no difficulty in determining, that it belongs to the Fungi. This Order is divided into two sec-

tions, the first containing those vegetables, that have a *pileus* or *cap*; the second including those, destitute of a *pileus*. We immediately perceive, that our specimen belongs to the first section, and, from the presence of gills, we are convinced, that it is an *AGARICUS*. This genus, on consulting the British Flora (p. 335), is found to be a very extensive one. It has eight subdivisions, established on the insertion, and substance of the stalk, and on the mode of attachment of the gills. Observing that the stalk is inserted in the centre of the pileus, we cut the stalk transversely with a sharp knife, and finding it to be perfectly solid, we, in the next place, pay attention to the gills, to see whether they are attached to the stalk, or not. Finding these neither decurrent nor fixed, we perceive, that our specimen belongs to the third subdivision, which is thus characterized, "*Stalks central, solid, gills loose.*"

In all the different subdivisions of this genus the species are arranged according to the colour of their gills, the colour of these, from its constancy, being found of considerable importance in the specific character. As the gills are of a pinky red, we pass over the species with white and brown gills, and, by comparing our plant with those which have red ones, we soon determine the species to be *A. campestris*. This species includes four Varieties, we therefore proceed to compare it with these, and pronounce it to be Variety first, with which it corresponds in every respect.

Several new terms occurring in the characters of the plants, belonging to this order, it will be found necessary to peruse the definitions, which are given in pages 83—91, before the investigation of the Fungi is undertaken.

VII. OF THE PALMÆ.

The PALMÆ are placed by Linnæus in an Appendix to the Sexual System; but, in the thirteenth edition of the *Systema Naturæ*, published by Gmelin, they are incorporated with the other classes, according to the number of their stamens. They form the first of the Natural Orders, and constitute one of the seven Families, and nine Nations, into which Linnæus has distributed the vegetable kingdom. Their stem is simple, and frondose at the top, and their fructifications on a spadix, proceeding from a spathe.

Schreber has enumerated seventeen genera; of which three are hermaphrodite, viz. *Thrinax*, *Corypha*, and *Licuala*; six are monoicous, *Cocos*, *Bactris*, *Areca*, *Elate*, *Nipa*, and *Caryota*; six are dioicous, *Borassus*, *Phoenix*, *Elæis*, *Mauritia*, *Cycas*, and

Zamia,† and two are polygamous, *Rhapis* and *Chamaerops*. None of these genera are natives of Great Britain.

For a further account of the *Palmae*, see Volume II. p. 307. and 353.

CHAPTER III.

OF THE FORMATION OF AN HERBARIUM.

The possession of an Herbarium, or Collection of Plants, well preserved and arranged, is of so much importance to the practical botanist, that it should be strongly recommended to every student, to engage early in the preparation of one. Besides affording him a convenient opportunity of keeping up, or renewing his acquaintance, at any time, with the appearance of all the plants, that he has investigated; it will enable him to correct many errors, and clear up many doubts, when he has made a further progress in investigation; and also to obtain information from other persons, respecting such species, as he cannot determine satisfactorily himself.

Plants are preserved for the purposes of the botanist,

1. By being dried.
2. By being immersed in liquids of various kinds.

The former method is attended with much less trouble, and expence, and may be more advantageously employed for preserving specimens of all the vegetables, belonging to the first 23 classes, and of a considerable part of those, referred to the class *Cryptogamia*.

The latter is resorted to, principally, for the preparation of those Funguses, which, from their succulency or tenderness, either cannot be dried, or do not admit of being dried of their proper form and colour, so as to be useful in a collection.

Different means are recommended for preserving plants *in the dry way*: Most botanists employ a press; some place their specimens in a box of sand; and others give the preference to a hot smoothing iron. Each of these processes has its advantages, and will therefore be particularly described. The specimens, in whichever way we intend to dry them, should be collected as free from

† *Cycas* and *Zamia* are referred to the Filices by Linnaeus, and it is doubtful, whether *Mauritia* be properly considered as a Palm.

moisture as possible, and in the state most fit for displaying their generic and specific characters to advantage. They should be carried home in a tin box, and remain in it till we are at liberty to attend to the preparation of them.

1. If we intend to employ pressure, it will be necessary to procure several pieces of strong pasteboard 16 inches long, and ten inches broad; six or eight quires of unsized blossom blotting paper, of the same size as the pasteboards; and a botanical press. The press should be made of two well planed boards of mahogany, or other wood not liable to warp, eighteen inches in length, twelve inches in breadth, and two inches in thickness. A male screw, made of metal, or very hard wood, and about eight inches long, should be fixed in each corner of the lower board, and four corresponding holes are to be made in the corners of the upper board, of a sufficient size to allow the male screws to pass easily through them. These two boards are to be screwed together by means of four nuts, made of the same materials as the screws, and of such a form as to be easily turned by the hand. For the convenience of moving and using the press, a handle, such as is used for drawers, should be fixed in the middle of the upper board. The press may be made of a larger or smaller size; it may have only two screws, one placed in the middle of each end; or it may be made of thinner boards, provided these be strengthened by plates of iron, or pieces of wood, fixed across them at each end. If a press cannot be procured, weights or books may be employed to give the requisite degree of pressure.

Having covered one of the pasteboards with a single sheet of paper, we should take one of our specimens carefully out of the tin box, and place it upon the paper in its most natural situation; and, after having spread out the leaves, and displayed the flowers in the manner, best adapted to shewing the generic character, we should place upon it three or four sheets of paper, or more, if the plant be either of a large size, or very succulent. We should dispose all our plants in the same manner upon the pasteboards, and then place them, piled one upon another, in the press, employing at first only a moderate degree of pressure: Or, instead of being put into the press, they may be placed under it, with the additional weight of one or two folio books, if necessary.

At the end of twenty-four hours the specimens are to be examined; those leaves and petals are to be spread out, which are found improperly folded together; the direction of the stem and branches, if necessary, is to be corrected and improved; and the upper sheets of paper are to be removed and replaced by an equal number of perfectly dry ones. It is necessary to observe here, that the papers should never be used a second time, without having

been previously dried by being placed before a fire, or put into an oven moderately heated.

The plants, thus disposed, are to be put into the press, and a pretty considerable force is to be employed in screwing it. If the press be placed near a fire, or be exposed to the sun, the colour of the specimens will be better preserved. When they have stood two days, they are to be examined a second time, all the papers are to be changed for dry ones, and they are to be again put into the press, and subjected to a very strong degree of pressure.

After remaining three days longer in the press, they are to be again taken out. Those specimens, that appear sufficiently dried, are to be removed each into a dry sheet of writing paper. And those, which, in consequence of their greater bulk, or succulency, still retain a degree of humidity, are to have fresh papers applied to them, and to be kept in the press two or three days longer, or as long as we find it necessary. We ought never to be in too great a hurry to remove our plants from the press: For if they be taken out, when insufficiently dried, the leaves and flowers shrivel, or they lose their colours, turn black, and become mouldy.

The above directions will suffice for the generality of specimens. But some slender plants, which dry very quickly, ought, in the first instance, to be exposed to a very considerable degree of pressure, in order to prevent them from shrivelling. And if we be particularly anxious to have very beautiful specimens, the papers should be changed every day, for nothing injures their colours so much as to leave them long exposed to moisture. When the specimens are small, to save unnecessary trouble, we may place two or more upon one pasteboard, taking care that they do not lie in contact with one another. Should the specimens be longer than our pasteboards, they are to be cut of a proper length, and one or two of the lower leaves, if necessary, preserved: But, if no part can be removed without injury to the specific character, the plants, if slender, as *Grasses*, &c., may be doubled; and if this cannot be practised, they should be divided, and the whole preserved; for those specimens are of little or no value, which do not completely exhibit the specific character. When the root is to be preserved, it should be cleared from dirt by being brushed or washed, and if it be very large, or of an orbicular form, it is advisable to thin it, by cutting away as much as we can, without injuring its figure. In preserving specimens with very large and firm compound flowers, as *Thistles*, &c., some botanists cut away one half of the flowers by a vertical section. And some take the trouble of removing the woody part of the branches of shrubs and trees, after dividing the bark with the point of a sharp knife. Un-

der this treatment the plants dry sooner, and occupy less room in a collection.

2. The method of drying plants in a box of sand is more expeditious than that already described, and, in some instances, succeeds better in preserving their colours. The specimens, after being moderately pressed for six or twelve hours, are to be placed within single sheets of dry blotting paper, and their leaves and flowers properly adjusted. They are then to be put into a box of sufficient size, with a layer of very fine dry sand, about an inch deep, in the bottom, and a similar layer is to be interposed between each of them. The box is to be placed near a large fire, or in an oven gently heated, for two or three days. At the end of this time the sand is to be carefully removed, by means of a common plate, and the plants are to be examined. Should any of them appear to be insufficiently dried, they are to be placed in the box again for a day or two longer, and exposed to the same degree of heat as before.—Sand is also employed for preserving plants, or flowers, of their original forms as well as colours. In this case a quantity of sand is to be warmed, and laid in the bottom of the box, so as to cover it to the height of an inch or two; the specimen is to be placed lightly upon it without any paper; and as much warm sand is to be sifted, or shaken gently into the box, as is sufficient to cover the specimen completely. The box, thus prepared, is to be placed near a fire, or in an oven, till the plant, or flower is sufficiently dried. Specimens, preserved in this manner, are very beautiful, but they are less fit for the purposes of an herbarium; as they occupy too much room, and are very liable to be injured, though moved with great care.

3. The method of ironing plants with a hot smoothing iron, if properly conducted, answers better than any other for preserving very succulent, and mucilaginous plants; and, as it requires but little time, is the most convenient in distant botanical excursions. The specimens are to be placed betwixt several sheets of blotting paper, and, after being gently pressed for a few hours, or without any previous pressure, are to be ironed till all their moisture be dissipated. The degree of heat, proper to be employed in the treatment of different kinds of plants, can only be determined from experience.

Whichsoever of the above methods is adopted, the specimens, as soon as they are completely dry, should be removed into sheets of writing paper of the same size as the blotting paper, used in preparing them; and the generic and trivial names of each, together with the time when it was found, the place, and any other remarks, that we may think proper, are to be written upon them. Some botanists fix their plants to the sheets of writing paper with glue,

or gum-water : but this practice is attended with no little trouble, and the specimens are more conveniently examined, when suffered to remain loose, within the papers.

The arrangement of our specimens deserves considerable attention, for, in proportion as this is more or less accurately executed, we shall be enabled to turn to them with greater or less facility. The most convenient method is to place together the species of each genus†; the genera of each section or subdivision; the sections of each order; and the orders of each class; and to distinguish these divisions from each other, by placing them in sheets of paper of different colours, and writing upon them their names or titles. The specimens, belonging to each class, may be placed betwixt two pasteboards, and tied closely with a piece of tape, to prevent the access of air, and to keep them in their proper forms and places. They may then be titled, and arranged as in the Sexual System. Or, instead of being tied up in pasteboards, they may be kept in a cabinet, made for the purpose, and having as many drawers as there are classes, that one drawer may be appropriated to each class. The drawers should be disposed in two rows. They should be made of a length and breadth, somewhat greater than the papers, in which our specimens are kept; and of a greater or less depth, in proportion to the number of species belonging to each class. They should have backs, and sides, as deep as the space allotted to them will allow, but should be open in front, excepting a very shallow ledge. The bottoms should slide in grooves, cut in the sides and partition of the cabinet, that no room may be lost. The cabinet should shut up with two doors in front, and should be made of a larger or smaller size, according as it is intended to contain british plants only, or both british and foreign ones.

The Specimens should be kept in a dry room, and examined occasionally, that they may not suffer from moisture, or the depredations of insects.

The methods of drying and arranging specimens, described above, are applicable to all the plants with conspicuous flowers, and, amongst the Cryptogamous plants, to the *Filices*, *Musci*, and some plants referred to the Order *Algæ*. But the *Musci* and many of the *Algæ*, on account of their minuteness, are more conveniently kept in papers of a smaller size, to which they may be fastened by paste, or gum-water. To prevent the depredations

† If a genus be very extensive, and have several subdivisions, the species, belonging to each of these, may also be kept in distinct sheets of paper.

of insects, when paste or gum-water is used, it is necessary to mix with them a quantity of the seeds of Staves-acre, reduced to a fine powder.

Some *Algae*, however, require a different treatment. The *Lichens* are best preserved by being merely dried without pressure, and they should be kept in shallow drawers, divided by numerous partitions, into very small squares. Each square should be appropriated to one species, and should have a piece of paper, or card, in the bottom, with the name of the specimen written upon it. It is sometimes advisable to gum or paste the specimens upon the papers or cards. The *Fuci* and other marine plants, before they be laid down to dry, should be repeatedly soaked in fresh water, for the purpose of extracting the salts from them, as the specimens, if this precaution be neglected, will imbibe water, in considerable quantity, from the atmosphere, and be injured by it.

The *Confervee*, and those *Fuci*, which have numerous fine branches, or segments, ought to be floated in a vessel of water, and carefully taken out in their expanded state, by slipping under them a pane of glass, or a thin board, with a piece of writing paper laid over it. Being afterwards dried between a few sheets of blotting paper, under a gentle pressure, they become, in some degree, incorporated with the writing paper, and frequently assume the appearance of beautiful drawings. Many of the *Fungi* may be preserved, and arranged in the manner, directed above for the *Lichens*; or they may be kept in small boxes.

For preserving specimens in the moist way, various liquids have been employed, as, Spirit of Wine, diluted with water in different proportions; Solutions of metallic, earthy, and neutral salts in water alone, or with an admixture of spirit; Mineral acids diluted with water; &c.

The stamens and pistils may be very well exhibited in liquids, and, if the texture and colours of the petals could be equally well preserved in them, moist preparations of flowers would be very useful and beautiful. But no liquids, that will answer these desirable purposes, have, I believe, yet been discovered. In the experiments, which I have made with this view, many flowers, especially the blue and pink ones, have entirely lost their colours, and many have become softened, and more or less transparent. The texture of flowers appears to be best preserved in proof spirit, or in spirit diluted with three or four times its quantity of water. A saturated solution of common salt answers tolerably well for preserving some flowers, and also for the *Musci* and many of the *Algae*.

When flowers are preserved in liquids, it is frequently necessary to fix small pieces of tinfoil, or thin sheet lead, round their peduncles, in order to keep them immersed. To prevent the access of air, and the evaporation of the liquid, the vials, or jars, in which they are kept, should be completely filled, and well corked. And, especially if spirit be used, we should glue or gum a piece of tinfoil over the mouth of the vessel, and tie over it a piece of moist bladder, which should be painted, when sufficiently dry. Or, instead of the tinfoil, some Venice Turpentine may be applied over the mouth of the vessel, by a painter's brush, and, when it is nearly dried, a piece of bladder should be tied tightly over it.

For preserving the *Fungi*, Dr. Withering, who has paid very great attention to the subject, recommends the use of a Pickle, and two Liquors of different degrees of strength.

The *Pickle* is prepared in the following manner: "Take two ounces of vitriol of copper reduced to fine powder; pour upon it about a tea cup of cold water, stir them with a piece of stick, or a quill, for about a minute, then pour off the water, and throw it away. On the remaining vitriol pour a pint of boiling water, and, when the whole is dissolved, and grown cool, add to it half a pint of rectified Spirit of Wine. Filtre it through paper, and keep it in a bottle closely corked."

The *Stronger Liquor* is composed of eight pints of pure spring water, and a pint and a half of rectified spirit of wine.

The *Weaker Liquor* is composed of eight pints of spring water, and one pint of spirit of wine.

The thinnest and most delicate funguses † should be immediately immersed in a quantity of the pickle, and, in about three hours, are to be removed into a wide-mouthed vial, or glass jar, of a proper size and form, completely filled with the weaker liquor.

The more fleshy and bulky specimens are to be exposed to the air, as long as they will admit of it, without danger of decaying, that a part of their moisture may be dissipated; they are then to be put into a jar, containing a quantity of the pickle, and after remaining in it one, two, or three days, according to their size, are to be removed into glass jars, filled with the stronger liquor.‡

† The funguses may be carried home, without injury, in a basket, with layers of moss interposed betwixt them.

‡ In the Linnean Transactions Dr. Withering has given the following receipt for preparing a Liquor to be used in preserving Funguses. "Dissolve a quarter of an ounce of Sugar of Lead in a pint of distilled, or very pure spring water, made boiling hot; add seven pints of pure cold water, and one pint of rectified

INTRODUCTION TO, &c.

The jars, after being perfectly closed in the manner directed above, should be titled, and arranged properly on shelves, or in drawers divided by partitions.

Agarics and Boletuses, which will admit of it without being injured, may be divided vertically, in order to shew the inside of the stalk, and the disposition of their gills or tubes.

Of instead of the tincture, some Venice Turpentine may be applied over the mouth of the vessel, by a painter's brush, and spirit of wine: filter the liquor, and keep it in bottles.—The above proportion of spirit of wine is sufficient for the thickest and most succulent specimens, but less will do for such as are thin, and not juicy. If the spirit be sufficient to prevent mouldiness, it is enough, for more has a tendency to extract the colours.

—Either this liquid, or the Pickle and Liquors above mentioned, may be also employed for preserving the *Musci*, *Alga*, and the plants with conspicuous stamens and pistils.

The Pickle is prepared in the following manner: pour ounces of vitriol of copper reduced to fine powder; pour upon it about a cup of cold water, stir them with a piece of stick, or a drill, for about a minute, then pour off the water, and throw it away. On the remaining vitriol pour a pint of boiling water, and when the whole is dissolved, and grown cool, add to it half a pint of rectified Spirit of Wine. Filter it through paper, and keep it in a bottle closely corked.

The Stronger Liquor is composed of eight pints of pure spring water, and a pint and a half of rectified spirit of wine.

The Weaker Liquor is composed of eight pints of spring water, and one pint of spirit of wine.

The thinnest and most delicate fungus should be immediately immersed in a quantity of the pickle, and, in about three hours, are to be removed into a wide-mouthed jar, or glass jar, of a proper size and form, completely filled with the weaker liquor.

The more fleshy and bulky specimens are to be exposed to the air, as long as they will admit of it, without danger of decaying; that a part of their moisture may be dissipated; they are then to be put into a jar containing a quantity of the pickle, and after remaining in it one, two, or three days, according to their size, are to be removed into glass jars, filled with the stronger liquor.

The fungus may be carried home, without injury, in a basket, with care of moss disposed between them.

In the *Botanical Transactions*, Dr. W. Smith has given the following receipt for preparing a liquor to be used in preserving fungus: "Dissolve a quantity of an ounce of sugar of Lead in a pint of distilled, or very pure spring water, made boiling hot; add seven pints of pure cold water, and mix them in a glass

BOTANICAL

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BOTANICAL

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BOTANICAL TERMS & DEFINITIONS

employed by

LINNÆUS.

DELINEATION OF A PLANT.

I. THEORY.

A. GENUS. The *most select* Name.

Character, natural, essential, artificial.

Class and Order of the *most excellent* System.

Natural Order to be demonstrated.

B. SPECIES. Trivial Name.

Specific Difference to be demonstrated: the *most certain*, and the *shortest*.

Synonyms from a Description, or *select* Figure; vernacular ones.

C. CRITICISMS. Etymology of the *generic* and *specific* name.

Discoverer *with* the time.

Erudition Historical, Critical, Antique.

II. DESCRIPTION.

A. ROOT, radix, an organ nourishing the plant.

a. DURATION.

1. Annual, *annua*, perishing within the year.
2. Biennial, *biennis*, flowering in the second year, and then perishing.
3. Perennial, *perennis*, continuing more than two years.

b. FIGURE:

- a. 4. Fibrous, *fibrosa*, consisting entirely of fibres or threads.
5. Branched, *ramosa*, subdivided into fibres. Pl. I. f. 1.
6. Fusiform, *fusiformis*, thick, oblong, attenuated. Pl. I. f. 2.
7. Premorse, *præmorsa*, appearing bitten off at the end.
- b. 8. Creeping, *repens*, running to some distance horizontally, and then sending off radicles or fibres. Pl. I. f. 3.
9. Jointed, *articulata*, intercepted with joints.
10. Dentate or Toothed, *dentata*, like a necklace, consisting of joints chained together.
- c. 11. Globular, *globosa*, roundish with lateral radicles.
12. Tuberous, *tuberosa*, consisting of fleshy parts, connected at the base by a thread. Pl. I. f. 4.
13. Fascicular, *fascicularis*, consisting of fleshy parts, connected by a sessile base (collected in bundles).
14. Palmate, *palmata*, fleshy, lobed. Pl. I. f. 5.
15. Bulbous, *bulbosa*, furnished with a bulb. Pl. I. f. 6. 7. 8.
16. Granulated, *granulata*, consisting of many small fleshy particles. Pl. I. f. 9.

c. DIRECTION:

17. Perpendicular, *perpendicularis*, descending nearly in a straight line.
18. Horizontal, *horizontalis*, running horizontally under the earth.

B. TRUNK, *truncus*, an organ multiplying the plant.

a. KIND.

19. Stem, *caulis*, a trunk supporting both the leaves and the fructification.
20. Culm, *culmus*, a trunk peculiar to grasses. Pl. II. f. 1.
21. Scape, *scapus*, a trunk elevating the fructification, but not the leaves. Pl. II. f. 2.
22. Stipe, *stipes*, a trunk passing into the leaves (not distinct from the leaves.—It is the base of a frond). Pl. II. f. 3.

b. DURATION.

23. Herbaceous, *herbaceus*, annual, (not woody).
24. Somewhat shrubby, *suffruticosus*, permanent at the base, the branches withering yearly.

25. Shrubby, *fruticosus*, peren., with many stocks (*caudices*).

26. Arboreous, *arbores*, perennial, with a simple stock (*caudex*).

c. SUBSTANCE.

27. Solid, *solidus*, full within.

28. Pithy, *inanis*, spongy within.

29. Fistulous *fistulosus*, tubular, empty within.

d. MEASURE.

a. (Proportion to the leaves and other parts).

b. Thickness, taken from some known body, which is similar.

e. DIRECTION.

a. 30. Erect, *erectus*, raising itself almost perpendicularly.

31. Stiff and straight, *strictus*. *Strictus* in Termini Bot. is defined "completely perpendicular without bending." But it is not used in this signification; and it does not appear to have any thing relating to perpendicularity, as it is generally applied. See Martyn's Dict.

32. Rigid, *rigidus*, inflexible.

33. Limber, or lax, *laxus*, easily bent into a bow.

34. Oblique, *obliquus*, neither in a perpendicular nor horizontal line.

35. Ascending, *ascendens*, rising archwise upwards.

36. Declined, *declinatus*, descending archwise.

37. Incurved, *incurvatus*, nodding inwards.

38. Nodding, *nutans*, reflected outwards at the top.

39. Diffuse, *diffusus*, the branchlets expanding.

40. Procumbent, *procumbens*, feeble, leaning upon the earth.

41. Stoloniferous, *stoloniferus*, giving out stolons from the root.

b. 42. Sarmentous, *sarmentosus*, filiform, the joints striking root.

43. Creeping, *repens*, lying upon the earth and sending out roots. Pl. II. f. 4.

44. Rooting, *radicans*, fixing itself by deep lateral roots.

c. 45. Geniculate, *geniculatus*, intercepted by internodes—Martyn is of opinion, that *nodosus* means knotty, or merely having knots, and that *geniculatus* implies that the stem is bent in an angle at the joint.

46. Flexuose, *flexuosus*, bending from bud to bud, in a zig-zag manner.

47. Climbing, *scandens*, rising high, and deriving its support from others.

48. Twining, *volubilis*, ascending spirally round other bodies.

a a. From right to left, *dextrorsum*, contrary to the Sun's apparent motion. Pl. II. f. 5.

b b. From left to right, *sinistrorsum*, according to the apparent motion of the sun. Pl. II. f. 6.—See Dictionary.

f. FIGURE.

- a. 49. Cylindrical, or columnar, *teres*, without angles.
 50. Half-cylindrical, or semi-columnar, *semiteres*, flat on one side, roundish on the other.

Obs. Columnar seems the more proper term, yet I have generally translated it cylindrical—*Cylindræus* and *Columnaris* are also used by Linnæus.

51. Compressed, *compressus*, the two opposite sides flat.
 52. Two-edged, *anceps*, with two opposite, rather acute angles.
 53. Angular or Angled, *angulatus*, grooved longitudinally with more than two hollow angles. 3—10-angled.

a a. Acute-angled, *acutangulus*.

b b. Obtuse-angled, *obtusangulus*, from the figure of the angles.

- b. 54. Three-cornered, &c. *trigonus*—6-gonus, with 3 to 6 prominent, longitudinal, angles.

55. Triquetrous or Three-sided, *triqueter*, with 3 exactly flat sides.

g. CLOTHING.

56. Naked, *nudus*, opposed to the 5 following terms 57—61.

57. Leafless, *aphyllus*, destitute of leaves.

58. Leafy, *foliatus*, furnished with leaves.

59. Sheathed *vaginatus*, surrounded with the sheaths of the leaves.

60. Scaly, *squamosus*, sprinkled with scales.

61. Imbricated, *imbricatus*, covered so as not to appear naked in any part.

h. SURFACE.

- a. 62. Cork-like, *suberosus*, furnished with an outer bark, softish, but elastick.

63. Chinky, *rimosus*, the outer bark cracking spontaneously.

64. Coated, *tunicatus*, clothed with membranes.

- b. 65. Even, *lævis*, the surface equal.

66. Striated, *striatus*, inscribed with very fine depressed lines.

67. Furrowed, *sulcatus*, ploughed with deep lines.

- c. 68. Smooth, *glaber*, with a slippery, or polished surface.

69. Rough, *scaber*, rough with projecting, and rather rigid points.

70. Muricated, *muricatus*, sprinkled with subulate points.

71. Tomentous, *tomentosus*, covered with soft hairs interwoven, but not discernible (359).

72. Villous, *villosus*, covered with soft hairs (356).

73. Hispid, *hispidus*, sprinkled with rigid bristles (361).

74. Prickly, *aculeatus*, armed with prickles (378).

75. Thorny, *spinousus*, armed with thorns (384).

76. Stinging, *urens*, sprinkled with stings (391).

d. 77. Stipuled, *stipulatus*, furnished with stipules (316*).

78. Membranous, *membranaceus*, flattened like a leaf.

79. Bulbiferous, *bulbifer*, producing bulbs.

i. COMPOSITION OF STRUCTURE.

a. 80. Knotless, *enodis*, continued without joints.

81. Simple, *simplex*, extended in a continued series towards the apex.

82. Very simple, *simplicissimus*, with scarcely any branches.

b. 83. Jointed, *articulatus*, with internodes and joints.

84. Proliferous, *prolifer*, putting forth branches only from the centre of the top.

85. Dichotomous, *dichotomus*, divided constantly into pairs. Pl. II. f. 7.

86. Brachiate, *brachiatus*, with the branches opposite cross-wise. Pl. II. f. 8.

c. 87. Somewhat branched, *subramosus*, with very few lateral branches.

88. Branched, *ramosus*, with several lateral branches.

89. Very much branched, *ramosissimus*, with very numerous branches, disposed without order.

d. 90. Rod-like, *virgatus*, the branchlets weak and unequal.

91. Panicked, *paniculatus*, the branches variously subdivided.

92. Fastigate, *fastigiatus*, the branches of equal height (forming a level top).

e. 93. Spreading, *patens*, the branches inserted at an acute angle.

94. Diverging, *divaricatus*, the branches going off at an obtuse angle.

—BRANCHES, *rami*, parts of the stem.

a. STRUCTURE.

Stem-like, *structura caulis*.

Frondose, *structura frondis*.

b. DISPOSITION.

95. Alternate, *alterni*, rising by steps about the trunk.

96. Two-rowed, *distichi*, pointing two ways, although arising on every side of the trunk.

97. Scattered, *sparsi*, going off in no determinate order.

98. Crowded, *conferti*, very numerous, almost concealing the whole trunk.

99. Opposite, *oppositi*, placed in a decussated manner in pairs.

100. Verticillate, *verticillati*, several surrounding the trunk at the joints (the intermediate spaces branchless).

c. DIRECTION.

a. 101. Erect, *erecti*, rising almost perpendicularly.

102. Compact, *coarctati*, almost incumbent towards the summit.

- 103. Diverging, *divergentes*, going off from the trunk at a right angle.
- 104. Divaricate, *divaricati*, going off at an obtuse angle.
- 105. Deflected, *deflexi*, declining downwards in an arch.
- 106. Reflected, *reflexi*, hanging down perpendicularly.
- 107. Retroflected, *retroflexi*, bent this way and that.
- 108. Fulcrate, *fulcrati* furnished with fulcres, or props.

d. HEIGHT OF LENGTH (compared with the stem).

- a. Long, *longi*.
- b. Short, *breves*.
- c. Spreading, *patentes*.

C. LEAVES, *folia*, organs of motion and respiration.

1. DETERMINATION. Leaves acquire marks from other circumstances, besides their peculiar structure, as from the

a. Place, where they are connected with the plant.

- 109. Seminal or Seed—, *seminale*, Seed-leaf, which was the cotyledon before, and is the first leaf which appears.

Pl. III. f. 1. a.

- 110. Radical, *radicale*, or Root-leaf, attached to the root.

Pl. III. f. 1. b.

- 111. Cauline, *caulinum*, or Stem-leaf, attached to the stem.

Pl. III. f. 1. c.

- 112. Branch-leaf, *ramcum*, attached to the branch. Pl. III.

fig. 1. d.

- 113. Axillary, *axillare*, s. *subalare*, inserted at the base of the branch. Pl. III. f. 1. e.

- 114. Floral, *florale*, nearest to the flower. Pl. III. f. 1. h.

Obs. The *Floral leaf* is to be distinguished from the *Bracte*, which is also placed near the flower; the latter being necessarily different from the other leaves in shape or colour, or both.

b. Number.

One, *unicum*. Two, *duo*. Three, *tria*, &c. Few, *pauca*.

Many, *plura*. Very numerous, *plurima*.

c. Situation.

- a. 115. Alternate, *alterna*, arising by steps round the branch. Pl. III. f. 1. g.

- 116. Two-rowed, *disticha*, pointing in two directions, although inserted on every side of the branch.

- 117. Bifarious, *bifaria*, arising only on the two opposite sides of the branch.

- 118. Scattered, *sparsa*, disposed in no regular manner.

- 119. Crowded, *conferta*, very numerous, almost concealing the whole of the trunk, or branch.

120. Imbricated, *imbricata*, covering half of each other in turn. Pl. III. f. 2. d.
121. Fascicled, *fasciculata*, many leaves proceeding from the same point (in bunches or bundles). Pl. III. f. 2. f.
122. Two together, *bina*. Three together, *terna*. Four together, Pl. III. f. 2. a. *quaterna*. Five together, *quina*. Six together, *senā*. Eight together, *octona*, &c. according to the number at the joints of the branches.
123. Confluent, *confluentia*, cohering with each other at the base.
124. Approximate, *approximata*, coming very near each other.
125. Remote, *remota*, distant from each other.
- b. 126. Opposite, *opposita*, placed in pairs crosswise. Pl. III. f. 1. c. c.
127. Decussated, *decussata*, disposed so that the leaves, when their points are attended to, appear in four rows. Pl. III. f. 2. c. c.
128. Stellate, *stellata*, more than two leaves together, surrounding the stem. Pl. III. f. 2. b.—3, 4, 5, 6, &c. together. (122).
- d. Direction.
- a. 129. Erect, *erectum*, placed almost perpendicularly. Pl. III. fig. 3. b.
130. Stiff and straight, *strictum*, altogether perpendicular without flexure. (31).
131. Rigid, *rigidum*, not bearing to be bent.
132. Appressed, *appressum*, approaching the stem with its disk. Pl. III. f. 3. f.
133. Spreading, *patens*, rising from the stem at an acute angle. Pl. III. f. 3. c.
134. Horizontal, *horizontale*, going off from the stem at a right angle. Pl. III. f. 3. d.
135. Assurgent, *assurgens*, archwise erect, first declining, and then erect at the point.
136. Inflected, *inflexum*, arched upwards towards the apex. Pl. III. f. 3. a.
137. Reclined, *reclinatum*, bent downwards so that the arch is lower than the base, and the apex ascending. Pl. III. f. 3. e.
138. Recurved, *recurvatum*, bent down so that the bow, or convexity, is upwards.
139. Revolute, *revolutum*, bent spirally. Pl. III. f. 3. g.
140. Dependent, *dependens*, looking straight on the earth, (hanging down, or pointing directly to the earth).
- b. 141. Oblique, *obliquum*, looking towards the sky with the base, towards the horizon with the apex e. g. *Fritillaria*.

142. Adverse, *adversum*, turning the upper side to the south, or sun, (not to the sky).

143. Vertical, *verticale*, obverse, having the region of the base narrower than the region of the apex. (Thus *verticali-cordate* is the same as *obcordate*).

144. Resupinate, *resupinatum*, the upper surface becoming the lower, and the contrary.

e. 145. Submersed, *submersum*, hidden under the surface of the water.

146. Floating, *natans*, lying on the surface of the water.

147. Rooting, *radicans*, striking root.

e. Insertion.

a. 148. Petioled, *petiolatum*, with a petiole (289*) inserted in the base. Pl. III. f. 4. a.

149. Peltate, *peltatum*, with a petiole inserted in the disk of the leaf. Pl. III. f. 4. b.

b. 150. Sessile, *sessile*, sitting immediately on the stem (without a petiole). Pl. III. f. 4. c.

151. Adnate, *adnatum*, joined by the upper surface to the base of the branch.

152. Coadunate, *coadunata*, several connected with each other.

153. Decurrent, *decurrens*, the base of the leaf extended downwards along the stem. Pl. III. f. 4. d.

154. Embracing the stem, or Stem-clasping, *amplexicaule*, surrounding the stem with its base. Pl. III. f. 4. e.

155. Perfoliate, *perfoliatum*, surrounding the stem transversely with its base, and not gaping before. Pl. III. fig. 4. f.

156. Connate, *connata*, pairs of opposite leaves conjoined at their base. Pl. III. f. 4. g.

157. Sheathing, *vaginans*, the base forming a tube and clothing the stem. Pl. III. f. 4. h.

2. STRUCTURE.

a. Figure.

a. 158. Roundish, *subrotundum*, almost orbicular. Pl. IV. f. 1.

159. Orbicular, *orbiculatum*, the circumference circular. Pl. IV. f. 2.

160. Ovate, *ovatum*, the longitudinal diameter exceeding the transverse; the base a segment of a circle, and the point narrower. Pl. IV. f. 3.

161. Oval, *ovale*, from a circle becoming oblong, both extremities being rounded and equal. Pl. IV. f. 4.

b. 162. Oblong, *oblongum*, the longitudinal diameter several times greater than the transverse. Pl. IV. f. 5.

163. Parabolic, *parabolicum*, gradually narrower towards the apex, and rounded. (Half-oval). Pl. IV. f. 55.
164. Cuneiform, *cuneiforme*, gradually narrowed towards the base. Pl. IV. f. 45.
165. Spatulate, *spatulatum*, roundish with a narrower linear (169) base. Pl. IV. f. 39.
- c. 166. Rounded, *rotundatum*, without angles.
167. Lanceolate, *lanceolatum*, oblong, tapering at each end. Pl. IV. f. 6.
168. Elliptical, *ellipticum*, lanceolate with the breadth of an ovate leaf. (Differing from oval (161) in being longer in proportion to its breadth.
169. Linear, *lineare*, every where of an equal breadth. Pl. IV. fig. 7.
170. Acerose, *acerosum*, linear (169), persisting (274). Pl. III. f. 2. e.
- b. *Angles.*
171. Entire, *integrum*, undivided; without any indentation.
172. Triangular, or Three-cornered, *triangulare*. Pl. IV. f. 12. Quadrangular, *quadrangulare*. Quinquangular, or Five-cornered, *quinquangulare*, &c. &c. according to the number of angles. Pl. IV. f. 20.
173. Deltoid, *deltoideum*, rhomb-shaped, having four angles, of which the lateral ones are nearer the base than the others. (A Deltoid leaf has the general appearance of a Δ or Triangle, but in reality it approaches in figure to a Rhomb, and like that has four angles, of which, the two at the sides are always nearer each other, than the two others at the base and apex, so that the length of the leaf is somewhat greater than the breadth. Martyn's Dict.). Pl. IV. f. 58.
174. Rhombed, *rhombeum*, or rhomb-shaped, in the form of a rhomb. (The ace of diamonds gives a perfect idea of this kind of leaf). Pl. IV. f. 51.
175. Trapeziform, *trapeziforme*, in the form of a trapezium. (A plane figure with four unequal sides).
- c. *Indentations.*
- a. 176. Cordate, *cordatum*, nearly ovate, hollowed at the base, and without any posterior angles. Pl. IV. f. 10.
177. Reniform, *reniforme*, roundish, hollowed out at the base, and without posterior angles. Pl. IV. f. 9.
178. Crescent-shaped, *lunatum*, roundish, hollowed out at the base, with posterior acute angles. Pl. IV. f. 11.
179. Sagittate, *sagittatum*, triangular with posterior acute angles, and an indentation at the base. Pl. IV. f. 13.

180. Hastate, *hastatum*, sagittate, with the posterior angles projecting laterally. Pl. IV. f. 15.
181. Runcinate, *runcinatum*, pinnatifid (189), so that the lobes, which are convex forwards, are transverse (or concave) behind. e. g. *Leontodon*. Pl. IV. f. 27.
182. Panduriform, *panduriforme*, oblong, broader below, contracted at the sides.
- b. 183. Cleft, *fissum*, divided by linear indentations, the margins being straight. Pl. IV. f. 16.—
 —Two-cleft, *bifidum*. Three-cleft, *trifidum*, &c. &c.
184. Lobed, *lobatum*, divided down to the middle into distant parts, with convex margins.
 —Two-lobed, *bilobum*. Three-lobed, *trilobum*, &c. Pl. IV. fig. 17.
185. Parted, *partitum*, divided almost to the base.
186. Two-parted, *bipartitum*. Three-parted, *tripartitum*. Four-parted, *quadripartitum*. Five-parted, *quinquepartitum*, &c. &c. Pl. IV. f. 28.
187. Palmate, *palmatum*, divided beyond the middle into nearly equal lobes. Pl. IV. f. 22.
188. Lyrate, *lyratum*, divided transversely into segments, of which the lower ones are smaller, and more distant from each other.
189. Pinnatifid, *pinnatifidum*, divided transversely into horizontal, oblong segments (which do not quite reach the midrib of the leaf). Pl. IV. f. 23.
190. Sinuated, *sinuatum*, having wide indentations on the sides. Pl. IV. f. 25.
191. Laciniated, *laciniatum*, cut into various indeterminate parts. Pl. IV. f. 24.
192. Squarrose, *squarrosus*, divided into elevated segments, not parallel to the plane of the leaf.
- d. Margin.
- a. 193. Very entire, *integerrimum*, the margin linear, and not in the least cut.
194. Crenate, *crenatum*, the margin cut in such a manner, that the notches do not incline towards either extremity. Pl. IV. f. 38. Doubly-crenate, *duplicato-crenatum*. Pl. IV. f. 33. Acutely-crenate, *acute crenatum*. Pl. IV. f. 35. Obtusely-crenate, *obtusely crenatum*. Pl. IV. f. 36.
195. Serrated, *serratum*, all the incisions in the margin respecting (looking towards) the extremity. Pl. IV. f. 31. Doubly-serrated, *duplicato-serratum*. Pl. IV. fig. 32.
196. Ciliate, *ciliatum*, having parallel bristles disposed along

the margin longitudinally (in the manner of the eyelashes). Pl. IV. f. 50.

197. Dentate, or toothed, *dentatum*, with remote spreading points along the margin. Pl. IV. f. 30.

—Dentato-sinuate, *dentato-sinuatum*. Pl. IV. f. 26.

198. Thorny, *spinosum*, having pungent, rigid, subulate points on the margin.

199. Cartilaginous, *cartilagineum*, the margin somewhat bony (firmer than the disk).

b. 200. Repand, *repandum*, having a flexuose but flat margin. Pl. IV. f. 29.

Obs. It differs from the Undulated (252.), in which the curvature respects the disk.

201. Ragged, *lacerum*, variously divided on the margin, the segments of different shapes.

202. Eroded, *erosum*, sinuated (190), with very small obtuse indentations and unequal segments. Pl. IV. f. 21.

203. Dedaleous, *dædaleum*, at once flexuose, and ragged.

e. *Apex* or Point.

a. 204. Obtuse, *obtusum*, terminated within the segment of a circle. Pl. IV. f. 40.

205. Emarginate, *emarginatum*, terminated by a notch. Acutely emarginate, *acute emarginatum*, Pl. IV. f. 44. Obtusely emarginate, *obtusely emarginatum*. Pl. IV. f. 45.

206. Retuse, *retusum*, terminated by an obtuse indentation. Pl. IV. f. 46.

207. Premorse, *præmorsum*, terminated obtusely with unequal notches. Pl. IV. f. 18.

208. Truncated, *truncatum*, terminating in a transverse line.

b. 209. Acute, *acutum*, terminating in an acute angle. Pl. IV. fig. 41.

210. Acuminate, *acuminatum*, terminating in a subulate (269) point. Pl. IV. f. 42. Obtusely-acuminate, *obtusum cum acumine*. Pl. IV. f. 43.

211. Cuspidate, *cuspidatum*, terminating in a setaceous point.

212. Mucronate, *mucronatum*, terminating in a projecting dagger-point.

213. Cirrhose, or Tendrilled, *cirrhosum*, terminating in a tendril. (346*).

f. *Surface*.

a. The Upper surface, *pagina superior*, commonly looks towards the sky.

The under surface, *pagina inferior*, respects the earth.

214. Naked, *nudum*, without hairs, or bristles.

215. Smooth, *glabrum*, with a slippery surface.

216. Shining, glossy, *nitidum*, with a shining smoothness.
 217. Lucid, *lucidum*, bright, as if illumined.
 218. Coloured, *coloratum*, of a colour different from green.
 219. Nerved, *nervosum*, with very simple vessels running from the base to the apex. Pl. IV. f. 53.
 220. Three-nerved, *trinerve*, having three nerves meeting in the base of the leaf.
 221. Trinervate, *trinervatum*, having three nerves meeting beyond the base of the leaf.
 222. Triplennerved, *triplinerve*, having three nerves, meeting above, or short of the base.
- Obs.* I must confess I do not see how these terms are expressive of such distinctions. I should have conceived, that by the last of them we were to understand a leaf having three-fold nerves, or running three and three together, and thus Dr. Berkenhout has explained it. MART.
223. Nerveless, *enerve*, without nerves.
 224. Streaked, *lineatum*, with depressed nerves.
 225. Striated, *striatum*, slightly hollowed with parallel lines.
 226. Furrowed, *sulcatum*, ploughed with deep lines. Pl. IV. fig. 61.
 227. Veined, *venosum*, having vessels variously divided. Pl. IV. f. 52.
 228. Wrinkled, *rugosum*, full of wrinkles.
 229. Bullate, *bullatum*, the substance rising high between the veins, so as to look like blisters, and only differing in degree from a wrinkled leaf.
 230. Pitted, *lacunosum*, having the disk depressed between the veins.
 231. Veinless, *avene* or *avenium*, destitute of veins.
- d. 232. Dotted, or punctate, *punctatum*, sprinkled with hollow points.
 233. Pimpled, *papillosum*, covered with fleshy points.
 234. Papulous, *papulosum*, covered with little blisters, or vesicular points. Pl. IV. f. 54.
 235. Viscid, *viscidum*, besmeared with a tenacious humour.
- e. 236. Villous, *villosum*, covered with soft hairs.
 237. Tomentous, *tomentosum*, covered with interwoven soft hairs, scarcely, or not at all discernible. Pl. IV. f. 48.
 238. Silky, *sericeum*, covered with very soft appressed hairs.
 239. Woolly, *lanatum*, clothed as with cobweb (the hairs spontaneously curling).
 240. Bearded, *barbatum*, beset with parallel hairs.
 241. Hairy, *pilosum*, covered with distinct long hairs. Pl. IV. f. 47.
 242. Rough, *scabrum*, covered with prominent and rather rigid points.

243. Hispid, *hispidum*, beset with rigid bristles. Pl. IV. f. 49.
 244. Prickly, *aculeatum*, armed with prickles (378).
 245. Strigose, *strigosum*, armed with rigid (32), lanceolate (167) prickles.

g. *Expansion.*

246. Flat, *planum*, with an equal surface.
 247. Channelled, *canaliculatum*, hollowed longitudinally above with a deep furrow.
 248. Concave, *concavum*, having the margin more contracted than the disk, and the disk depressed.
 249. Convex, *convexum*, having the margin more contracted than the disk, and the disk elevated.
 250. Cowled, *cucullatum*, the sides converging at the base, dilated at the apex.

Obs. Folded in a conical form, as the Grocers do paper to hold Sugar, &c.

251. Plaited, *plicatum*, having the disk alternately bent in acute folds. Pl. IV. f. 37.
 252. Undulated, *undatum*, s. *undulatum*, having the disk alternately bent in obtuse folds. See Repand (200).
 253. Curled, *crispum*, the margin luxuriant, so that the disk is longer than the rachis, or midrib.

h. *Substance.*

- a. 254. Membranous, *membranaceum*, the proper substance of a leaf (little or no pulpy substance being interposed).
 255. Scariose, *scariosum*, substance dry, parched, and sounding when touched.
 256. Gibbous, *gibbum*, both surfaces convex, from the interposition of a more copious pulp.
 257. Columnar, *teres*, almost cylindrical. Pl. IV. f. 62. (See 49, 50.)
 258. Depressed, *depressum*, pulpy, with the disk more flattened than the sides.
 259. Compressed, *compressum*, pulpy, the sides more flattened than the disk.
 260. Keeled, *carinatum*, the prone (inferior) surface of the disk prominent longitudinally.
 b. 261. Compact, *compactum*, consisting of a solid substance.
 262. Tubular, *tubulosum*, internally hollow or pithy.
 263. Pulpy, *pulposum*, filled with a tenacious matter.
 264. Fleshy, *carnosum*, filled within with a somewhat solid pulp.
 c. 265. Triquetrous, or Three-sided, *triquetrum*, subulate (269), with three longitudinal sides. Pl. IV. f. 59.
 266. Two-edged, *anceps*, having two prominent longitudinal angles, the disk somewhat convex.

267. Lingulate, *lingulatum*, linear (168), fleshy (264), convex (249) underneath.
268. Ensiform, *ensiforme*, two-edged (266), gradually tapering from the base to the apex.
269. Subulate, *subulatum*, linear at the base. tapering towards the point. Pl. IV. f. 8.
270. Acinaciform, *acinaciforme*, compressed (259), fleshy (264), one margin convex, thin; the other straighter, thicker. Pl. IV. f. 56.
271. Dolabriform, *dolabriforme*, compressed (259), roundish (158), outwardly gibbous (256), the edge short, roundish beneath. Pl. IV. f. 57.

i. Measure.

Very short, *brevissimum*, with respect to the stem or joints.
Very long, *longissimum*.

k. Duration.

272. Deciduous, *deciduum*, falling off at the end of one summer.
273. Caducous, *caducum*, falling off very soon, not remaining the whole summer.
274. Persisting, or Permanent, *persistens*, not falling off at the end of one summer.
275. Perennial, *perenne*, flourishing during several years.
276. Evergreen, *sempervirens*, flourishing in all seasons of the year.

3. COMPOSITION.

a. Compound, the petiole supporting more than one leaf.

277. Jointed, *articulatum*, one leaf growing from the top of another.
278. Conjugate, *conjugatum*, pinnate (282), with only two lateral leaflets.
279. Digitate, *digitatum*, a single petiole connecting several leaflets at the end. Pl. V. f. 4.
280. Binate, *binatum*, digitate (279), with two leaflets Pl. V. fig. 1 Ternate, *ternatum*, digitate, with three leaflets. Pl. V. f. 2 and 3. Quinate, *quinatum*, &c.
281. Pedate, *pedatum*, the petiole bifid, and connecting several leaflets by the inner side only. Pl. V. f. 5.
282. Pinnate, *pinnatum*, the petiole simple, connecting several leaflets at the sides.
283. Two-paired, or Bijugous, *bijugum*. Three-paired, *trijugum*. Four-paired, *quadrijugum*, &c. with 4—6—8 leaflets.
- Pinnate with an odd one, *pinnatum cum impari*, terminated by a single (odd) leaf. Pl. V. f. 6.

Pinnate abruptly, *abrupte*, neither terminated by a leaflet, nor a tendril. Pl. V. f. 7.

— tendrilled, *cirrhosum*, terminated by a tendril (346). Pl. V. f. 10.

— oppositely, *foliolis oppositis*, the leaflets opposite. Pl. V. fig. 7.

— alternately, *foliolis alternis*, the leaflets placed alternately. Pl. V. f. 8.

— interruptedly, *foliolis interruptis*, having the alternate leaflets smaller. Pl. V. f. 9.

— decursively, *foliolis decursivis*, having the leaflets running down the petiole. Pl. V. f. 12.

— jointedly, *articulate*, the common petiole being jointed. Pl. V. f. 13.

b. *Decomound*. Doubly compound.

284. Bigeminate, *bigeminum*, a dichotomous petiole connecting several leaflets at the apex.

285. Biternate, *biterdatum*, doubly ternate (280). Pl. V. f. 15.

286. Bipinnate, *bipinnatum*, doubly pinnate (282). Pl. V. f. 16.

c. *Superdecompound*. More than doubly compound.

287. Tregeminate, *tregeminum*, triply-geminate, a bifid petiole bearing two leaflets at each summit, and two others at the fork of the common petiole.

288. Triternate, *triternatum*, thrice ternate. Pl. V. f. 17.

289. Tripinnate, *tripinnatum*, thrice pinnate. Pl. V. fig. 18 and 19.

D. *FULCRES*, *fulcra*, props for the more commodious support of the plant.—*Fulcres* comprehend Petiole, Stipule, Tendril, Pubescence, Arms, Peduncle, Bracte.

1. 289*. *PETIOLE*, *petiolus*, a fulcre supporting a leaf.

a. *Figure*.

290. Linear, *linearis*, (169).

291. Winged, *alatus*, dilated at the sides.

292. Clubshaped, *clavatus*, thicker towards the apex.

293. Membranous, *membranaceus*, flatted.

294. Columnar, or Cylindrical, *teres*, (49).

295. Semi-columnar, or Half-cylindrical, *semiteres*, (50).

296. Triquetrous, *triqueter*, (55).

297. Channelled, *canaliculatus*, (247).

b. *Magnitude*.

298. Very short, *brevissimus*, not nearly as long as the leaf.

299. Short, *brevis*, not as long as the leaf.

300. Middle-sized, *mediocris*, as long as the leaf.

301. Long, *longus*, longer than the leaf.

302. Very long, *longissimus*, several times longer than the leaf.

c. *Insertion.*

303. Inserted, *insertus*, sitting perpendicularly on the branch.

304. Adnate, *adnatus*, (151).

305. Decurrent, *decurrens*, (153).

306. Stem-clasping, *amplexicaulis*, (154).

307. Appendaged, *appendiculatus*, having leafy films at the base.

d. *Direction.*

308. Erect, *erectus*, (129).

309. Spreading, *patens*, (133).

310. Assurgent, *assurgens*, (135).

311. Recurved, *recurvatus*, (138).

e. *Surface.*

312. Smooth, *glaber*, (215).

313. Prickly, *aculeatus*, (244).

314. Naked, *nudus*, (214).

315. Jointed, *articulatus*, (83).

g. 316. Spinescent, *spinescens*, growing hard, and sharp.

2. 316*. STIPULES, *stipulae*, scales standing at the base of the rising petioles. Pl. III. f. 5. a.

a. 317. In pairs, *geminæ*, two and two, in pairs.

318. Solitary, *solitariae*, simple, scattered.

319. None, *nullæ*.

b. 320. Lateral, *laterales*, inserted on the sides.

321. Extrafoliaceous, *extrafoliaceæ*, placed beneath the leaf.

322. Intrafoliaceous, *intrafoliaceæ*, placed above the leaf.

323. Oppositifolious, *oppositifoliae*, placed opposite to the leaf.

c. 324. Caducous, *caducæ*, (273).

325. Deciduous, *deciduae*, (272).

326. Persisting, *persistentes*, remaining after defoliation.

327. Spinescent, *spinescentes*, (316).

d. 328. Sessile, *sessiles*, (150).

329. Adnate, *adnatæ*, (151).

330. Decurrent, *decurrentes*, (153).

321. Sheathing, *vaginantes*, (157).

e. 322. Subulate, *subulatæ*, (269).

333. Lanceolate, *lanceolatae*, (167)

334. Sagittate, *sagittatae*, (179)

335. Crescent-shaped, *lunatae*, (178).

f. Erect, *erectæ*, (129).

337. Spreading, *patentes*, (133).

338. Reflected, *reflexa*, (186).
 g. 339. Very entire, *integerrima*, (193).
 340. Serrated, *serrata*, (195).
 341. Ciliate, *ciliata*, (196).
 342. Toothed or dentate, *dentata*, (197).
 343. Cleft, *fissa*, (183).
 h. 344. Very short, *brevissima*, not nearly as long as the petiole.
 345. Middle-sized, *mediocres*, of the length of the petiole.
 346. Long, *longa*, longer than the petiole.
 3. 346*. TENDRIL, *cirrus*, a filiform spiral band, by which a plant is tied to another body. Pl. III. f. 5. b.
 a. 347. Axillary, *axillaris*, (113).
 348. Foliar, or Leaf-, *foliaris*, leaf-tendrils, growing upon the leaf.
 349. Petiolar, *petiolaris*, placed on the petiole.
 350. Peduncular, *peduncularis*, situated on the peduncle.
 b. 351. Simple, *simplex*, undivided.
 352. Three-cleft, *trifidus*, divided into three parts.
 353. Many-cleft, *multifidus*, several times divided.
 c. 354. Convolute, *convolutus*, twisted into rings.
 355. Revolute, *revolutus*, the spiral line, after having made half a revolution, turned back in a contrary direction.
 4. 355*. PUBESCENCE, *pubes*, every kind of hairiness observed on plants.
 a. 356. Hairs, *pili*, setaceous excretory ducts of the plant.
 — Soft hairs, *villi*, soft close hairs like the pile on velvet.
 357. Wool, *lana*, curled dense hairs.
 358. Beard, *barba*, parallel hairs.
 359. Tomentum, *tomentum*, interwoven soft hairs, scarcely discernible.
 360. Strigas, *strigæ*, flattish, rather rigid hairs.
 b. 361. Bristles, *setæ*, somewhat rigid and round hairs.
 362. Simple, *simplices*, extended longitudinally, and not divided.
 363. Hooked, *hamosa*, easily adhering to animals.
 364. Branched, *ramosæ*, subdivided into a kind of branchlets.
 365. Feathery, *plumosa*, villous, compounded.
 366. Stellate, *stellata*, disposed in a decussated manner.
 Obs. When a little star of smaller hairs is affixed to the end. MART.
 c. 367. Hooks, *hami*, daggers with a crooked point.
 368. Barbs, *glochides*, daggers many-toothed at the end, the teeth pointing backwards.
 d. 369. Bladder, *utriculus*, a small vessel filled with a secreted fluid.

18 BOTANICAL TERMS, &c. Pubescence. Glands.

- e. 370. Glands, *glandulae*, small bodies excreting a fluid.—Concave, *concauae*. Pl. III. f. 5. c.
 371. Foliaceous, *foliaceae*, inserted in the leaves. Pl. III. fig. 5. c.
 — Sessile, *sessiles*. Pl. III. f. 5. c.—Pedicelled, *pedicellatae*. Pl. III. f. 5. d.
 372. Petiolar, *petiolares*, (349). Pl. III. f. 5. d.
 373. Peduncular, *pedunculares*, (350).
 374. Stipular, *stipulares*, inserted in the stipules.
 375. Calycine, or Calyx-glands, *calycinae*, inserted in the calyx (534).
 f. 376. Viscosity, *viscositas*, the quality of a tenacious fluid.
 377. Glutinosity, *glutinositas*, the quality of a slippery fluid.
 5. 377*. ARMS, *arma*, daggers driving away animals.
 a. 378. Prickles, *aculei*, pricking daggers, affixed only to the bark of the plant. Pl. III. f. 6. a.
 379. Straight, *recti*, without flexures.
 380. Incurved, *incurvi*, bent inwards.
 381. Recurved, *recurvi*, bent outwards.
 b. 382. Forks, *furcae*, prickles divided into two or more at the end.
 383. Bifid, *bifidae*. Pl. III. f. 6. b. Three-cleft, *trifidae*, Pl. III. f. 6. c. &c. &c. according to the number of the division.
 c. 384. Thorn, *spina*, a dagger protruded from the wood of the plant.
 385. Terminal, or Terminating, *terminalis*, placed on the apex of the plant.
 386. Axillary, *axillaris*, (113).
 387. Calycine, *calycina*, fixed on the calyx.
 388. Foliar, or Leaf-, *foliaris*, (348).
 389. Simple, *simplex*, (362). Pl. III. f. 7. a.
 390. Divided, *divisa*, parted at the point. Pl. III. f. 7. b.
 d. 391. Stings, *stimuli*, daggers forming inflammatory punctures.
 392. Pungent, *pungentes*,
 393. Burning, *urentes*, } according to the pain produced.
 6. 393*. BRACTES, *bractea*, floral leaves differing in appearance from the other leaves. Pl. III. f. 1. f.
 a. 394. Coloured, *coloratae*, (218).
 395. Caducous, *caducae*, (273).
 396. Deciduous, *deciduae*, (272).
 397. Persisting, *persistentes*, (274).
 b. — One, *una*. Two, *duae*. Several, *plures*, &c.
 a. 398. Tuft, *coma*, bractes terminating the stem, remarkable for their size.

d. Other terms applicable to leaves, are also to be referred to Bractes. See above.

7. 398*. PEDUNCLE, *pedunculus*, a fulcrum supporting the fructification.

399. Partial, *partialis*, (a—e) bearing several flowers of the common peduncle.

400. Common, *communis*, common to many flowers.

401. Pedicel, *pedicellus*, proper to each of the flowers on the common peduncle.

a. PLACE.

402. Radical, or Root-, *radicalis*, (110).

403. Cauline, or Stem, *caulinus*, (111).

404. Rameous, or Branch-, *rameus*, (112).

405. Petiolar, *petiolaris*, (349).

406. Tendril-bearing, or Cirrhiferous, *cirrhiferus*.

407. Terminating, *terminalis*, (385).

408. Axillary, *axillaris*, (386).

409. Oppositifolious, *oppositifolius*, (323).

410. Side-flowered, *lateriflorus*, (320).

411. Suprafoliaceous, *suprafoliaceus*, placed on the surface of the leaf.

412. Intrafoliaceous, *intrafoliaceus*, (322).

413. Extrafoliaceous, *extrafoliaceus*, (321).

b. SITUATION.

414. Alternate, *alternus*, (115).

415. Scattered, *sparsus*, (118).

416. Opposite, *oppositus*, (126).

417. Verticillate, *verticillatus*, (100).

c. NUMBER.

418. Solitary, *solitarius*, (318).

419. In pairs, *geminatus*.

420. Umbellet, *umbellula*, in an Umbellet there are several peduncles proceeding from the same centre, and forming an equal circumference.

d. DIRECTION,

421. Appressed, *appressus*, (132).

422. Erect, *erectus*, (129).

423. Spreading, *patens*, (133).

424. Cernuous, *cernuus*, the apex pointing towards the earth.

425. Resupinate, *resupinatus*, (144).

426. Declined, *declinatus*, (36).

427. Nodding, *nutans*, (38).

Obs. The peduncle considerably curved, but not so much as is expressed by CERNUOUS.

429. *Flaccidus*, *flaccidus*, with its leaf hanging down from the weight of the flower. See above. 222.
430. *Pendulous*, *pendulus*, loose, so as to tend downwards with its leaf. (a) bearing several flowers of the same kind. 339.
431. *Stiff and straight*, *strictus*, (81).
432. *Flexuose*, *flexuosus*, bending from flower to flower. 339.
433. *Retrofractus*, *retrofractus*, appearing as if brought to hang down by force. the common peduncle.

e. MEASURE.

434. *Short*, *brevis*, (299).
435. *Very short*, *brevissimus*, (299).
436. *Long*, *longus*, (301).
437. *Very long*, *longissimus*, (301).

f. NUMBER OF FLOWERS.

- One-flowered, *uniflorus*. Two-flowered, *diflorus*. Three-flowered, *triflorus*. Many-flowered, *multiflorus*.

g. STRUCTURE.

438. *Columnar*, or *Cylindrical*, *teres*, (49).
439. *Triquetrous*, *triquetus*, (55).
440. *Four-cornered*, *tetragonus*, (54).
441. *Filiform*, *filiformis*, slender, and every where of equal thickness.
442. *Attenuated*, *attenuatus*, diminishing gradually in thickness towards the extremity.
443. *Clubshaped*, *clavatus*, (292).
444. *Incrassated*, *incrassatus*, increasing gradually in thickness towards the extremity.
445. *Scaly*, *squamosus*, (60).
446. *Naked*, *nudus*, (214).
447. *Leafy*, *foliatus*, (58).
448. *Bracteate*, *bracteatus*, furnished with bractes.
449. *Geniculate*, *geniculatus*, (45).
450. *Jointed*, *articulatus*, (83).

E. INFLORESCENCE, *inflorescentia*, is the manner in which flowers are joined to the plant by their peduncles.

451. *Spadix*, *spadix*, the receptacle of a Palm, produced within a spathe, divided into fructifying branchlets. Pl. VI. f. 6.
452. *Cyme*, *cyma*, a receptacle from the same universal centre, elongated into fastigate (92) peduncles, but with the partial ones scattered, or irregular. Pl. VII. f. 11.
453. *Umbel*, *umbella*, a receptacle from the same centre, elongated into proportionate filiform peduncles. Pl. VII. fig. 5.

454. Simple, *simplex*, all the peduncles arising from one and the same receptacle.
455. Compound, *composita*, all the peduncles supporting umbellets on their tops.
456. Universal, *universalis*, composed of several simple ones.
457. Partial, *partialis*, (or umbellet, *umbellula*,) part of an universal one.
458. Proliferous, *prolifera*, an umbel more than decom-pound.
459. Aggregate Flower, *aggregatus flos*, the receptacle dilated, the florets somewhat peduncled.
460. Compound Flower, *compositus flos*, the receptacle dilated, entire, the florets sessile. Pl. VII. f. 9. 10. 12.
461. Spike, *spica*, alternate sessile flowers on a common simple peduncle. Pl. VII. f. 1.
462. Ament, *amentum*, consisting of a common chaffy, gem-maceous receptacle. Pl. VII. f. 7.
463. Strobile, *strobilus*, formed from an ament, the scales becoming indurated. Pl. VI. f. 5.
464. Corymb, *corymbus*, formed from a spike, each flower being furnished with its proper peduncle, and proportionally elevated. Pl. VII. f. 2.
465. Raceme, *racemus*, a peduncle furnished with lateral branches. Pl. VII. f. 3.
465. The line is not very distinctly drawn between a Spike and a Raceme.
466. Panicle, *panicula*, scattered flowers on differently divided peduncles. Pl. VII. f. 4.
467. Thyse, *thrysus*, a panicle condensed into an ovate form, as in *Tussilago Petasites* (Butter-bur).
468. Fascicle, *fasciculus*, collecting erect, parallel, fastigate, approximate flowers, as in *Dianthus barbatus* (Sweet William).
469. Head, *capitulum*, several flowers collected into a glo-bular form.
470. Verticil, *verticillus*, several flowers surrounding the stem like a ring. Pl. VII. f. 6.
471. Side-flowered, *lateriflora*, many flowers affixed to the same side of the stem.

FLOWERS.

- a. 472. Terminating, *terminales*, (393).
473. Lateral, *laterales*, (320).
474. Scattered, *sparsi*, (118).
475. Crowded, *conferti*.
- b. 476. Sessile, *sessiles*, (150).
477. Peduncled *pedunculati*, furnished with peduncles. (398*).
- c. 478. Single, *unicus*, the plant only producing one flower.

479. Solitary, *solitarius*, (318).
 480. Three together, *terni*, (122).—Four together, *quaterni*, &c. &c.
 481. Numerous, *copiosi* s. *plures*, of an indeterminate number at the extremity of each branch, or at the joints of the branches.
 d. 482. Erect, *erecti*, (30).
 483. Cernuous, *cernui*, (424).
 484. Nodding, *nutantes*, (427).
 485. Resupinate, *resupinati*, (144).
 — One-rowed, *secundi*, pointing one way.
 e. 486. Vertical, *verticales*, (143).
 487. Horizontal, *horizontales*, (134).
 f. 488. Superaxillary, *superaxillares*, above the axil.
 489. Oppositifolious, *oppositifolii*, (323).
 490. Side-flowered, *lateriflori*, (471).
 491. Interfoliaceous, *interfoliacei*.
 a. VERTICIL, *verticillus*, (470).
 a. 492. Sessile, *sessilis*, without evident pedicels.
 493. Peduncled, *pedunculatus*, with peduncles elevating the flowers.
 b. 494. Naked, *nudus*, without involucre, or bracte.
 495. Involucred, *involucratus*, furnished with an involucre.
 496. Bracteate, *bracteatus*, (449).
 c. 497. Crowded, *confertus*, the peduncles approximate.
 498. Distant, *distans*, the peduncles remote.
 b. HEAD, *capitulum*, (469).
 a. 499. Roundish, *subrotundum*, almost globular.
 500. Globular, *globosum*, round on every side.
 501. Halved, *dimidiatum*, round on the one side, flat on the other.
 b. 502. Leafy, *foliosum*, leaves intermixed with the flowers.
 503. Naked, *nudum*, without leaves or bristles.
 c. SPIKE, *spica*, (461).
 a. 504. Simple, *simplex*, continued, undivided.
 505. Compound, *composita*, consisting of many spikelets growing on the peduncle.
 506. Glomerate, *glomerata*, consisting of spikelets variously heaped together.
 507. Two-rowed, *disticha*, all the flowers pointing two ways.
 b. 508. Ovate, *ovata*, (160).
 509. Ventricose, *ventricosa*, gibbous (256) at the sides.
 510. Cylindrical, *cylindrica*, every where of the same diameter, (49).
 511. Interrupted, *interrupta*, consisting of smaller alternate distant spikes.

- 512. One-rowed, *secunda*, all the flowers bent to one side.
- c. 513. Imbricated, *imbricata*, (120).
- 514. Jointed, *articulata*, (83).
- 515. Branched, *ramosa*, variously divided.
- 516. Linear, *linearis*, (169).
- 517. Ciliate, *ciliata*, (196).
- 518. Foliaceous, *foliacea*, intermixed with leaves.
- 519. Comose, *comosa*, terminated by leaflets.
- d. CORYMB, *corymbus*, (464).
- 520. Simple, *simplex*, when each flower is furnished with its proper peduncle.
- 521. Compound, *compositus*, when all the flowers are elevated upon pedicels, sitting upon the common peduncles.
- e. THYRSE, *thyrsus*, (467).
- 522. Naked, *nudus*, not leafy.
- 523. Leafy, *foliatus*, clothed with leaves.
- f. FASCICLE, *fasciculus*, (468).
- g. RACEME, *racemus*, (465).
- a. 524. Simple, *simplex*, undivided.
- 524*. Compound, *compositus*, divided into several.
- b. 525. One-sided, or Unilateral, *unilateralis*, all the flowers inserted on one side.
- 526. One-rowed, *secundus*, all the flowers turned to one side.
- 527. Pedate, *pedatus*, (281).
- 528. Conjugate, *conjugatus*, (278).
- c. 529. Erect, *erectus*, (129).
- 530. Lax, or Limber, *laxus*, (33).
- 531. Dependent, *dependens*, (140).
- d. 532. Naked, *nudus*.
- 533. Leafy, *foliatus*, (58).
- h. PANICLE, *panicula*, (466).
- 534. Crowded, or Heaped, *congesta*, having numerous florets.
- 535. Dense, *densa* s. *coarctata*, having the florets close, as well as numerous.
- 536. Spiked, *spicata*, approaching to the form of a spike.
- 537. Contracted, *contracta*, differing from the former only in degree.
- 538. Spreading, *patens*, the pedicels spreading out so as to form an acute angle with the stalk.
- 539. Diffuse, *diffusa*, having the pedicels spreading out more, and irregularly.
- 540. Diverging, or divaricate, *divaricata*, spreading out so as to form an obtuse angle.

F. FRUCTIFICATION, *fructificatio*, a temporary part of vegetables for the purpose of generation.—When perfect, it consists of seven parts, *Calyx*, *Corol*, *Stamen*, *Pistil*, *Pericarp*, *Seed*, and *Receptacle*.

- 541. Simple, *simplex*, consisting of few flowers.
- 542. Compound, *composita*, consisting of several confluent florets.
- 1. 543. CALYX, *calyx*, the bark of the plant present in the fructification.
- a. 544. PERIANTH, *perianthium*, a calyx contiguous to the fructification.
- 545. Of the Fructification, *fructificationis*, including the stamens and germen. Pl. VI. f. 2. a.
- 546. Of the Flower, *floris*, containing the stamens, but not the germen. Pl. VI. f. 12. b.
- 547. Of the Fruit, *fructus*, containing the germen without the stamens. Pl. VI. f. 12. a.
- 548. Persisting, *persistens*, not falling off till the fruit be ripe.
- 549. Deciduous, *deciduum*, falling off with the corol.
- 550. Caducous, *caducum*, falling off on the first expansion of the flower.
- 551. PROPER, *proprium*, belonging to a single flower.
- a. *Parts*.
- 552. One-leaved, *monophyllum*, consisting of one leaf only. Two-leaved, *diphyllum*. Three-leaved, *triphyllum*, &c. &c. according to the number of leaves.
- 553. Many-leaved, *polyphyllum*.
- b. *Segments*.
- 554. Two-cleft, *bifidum*. Three-cleft, *trifidum*, &c. (183).
- 555. Two-parted, *bipartitum*, &c. &c. (186).
- 555*. Entire, *integrum*.
- c. *Figure*.
- 556. Tubular, *tubulosum*, (262).
- 557. Spreading, *patens*, (133).
- 558. Reflected, *reflexum*, the parts bent backwards.
- 559. Inflated, *inflatum*, hollow like a bladder.
- 560. Globular, *globosum*, approaching the figure of a globe.
- 561. Clubshaped, *clavatum*, (292).
- 562. Erect, *erectum*, (129).
- d. *Proportion*.
- 563. Abbreviated, *abbreviatum*, not as long as the tube of the corol.
- 564. Long, *longum*, longer than the tube of the corol.

565. Of the length of the tube of the corol, *longitudine tubi corollæ*, or Middle-sized, *mediocre*.
- e. *Top*.
566. Obtuse, *obtusum*, (204).
567. Acute, *acutum*, (209).
568. Thorny, *spinosum*, (75).
569. Prickly, *aculeatum*, (244).
570. Acuminate, *acuminatum*, (210).
- f. *Equality*.
571. Equal, *æquale*, all the segments of the same size.
572. Unequal, *inæquale*, some of the segments smaller.
573. Lipped, *labiatum*, the segments irregular, and formed into two lips.
- g. *Margin*.
574. Very entire, *integerrimum*, (193).
575. Serrated, *serratum*, (195).
576. Ciliate, *ciliatum*, (196).
- h. *Surface*. See Leaves (214—253).
- i. *Situation with respect to the Germen*.
577. Superior, *superum*, when the germen is under the receptacle.
578. Inferior, *inferum*, when the germen is above the receptacle.
- k. *Duration*.
579. Caducous, *caducum*, falling off on the first expansion of the flower.
580. Deciduous, *deciduum*, falling off with the corol.
581. Persisting, *persistens*, not falling off till the fruit be ripe.
582. COMMON, *commune*, containing several flowers collected together.
583. Imbricated, *imbricatum*, covered with scales, placed one over another.
584. Squarrose, *squarrosus*, with scales diverging on every side.
585. Scariose, *scariosum*, (255).
586. Turbinate, *turbinatum*, inversely conical.
587. Calycked, *calyculatum*, surrounded with another smaller calyx, or perianth at the base.
- b. 588. INVOLUCRE, *involucrum*, a calyx remote from the flower.

26. BOTANICAL TERMS, &c. Fructification. Involucre.

- a. 589. Universal, *universale*, placed beneath an universal umbel. Pl. VII. f. 5. b. 590. Partial, *partiale*, placed beneath a partial umbel. (Or an Involucet, *involucellum*.) Pl. VII. f. 5. c. c. 591. Proper, *proprium*, placed beneath each flower.
- b. 592. One-leaved, *monophyllum*. Two-leaved, *diphyllum*, &c. &c. according to the number of leaves. (552). 593. Many-leaved, *polyphyllum*.
- c. 594. GLUME, *gluma*, the calyx of a grass with embracing valves. See Vol. II. Pl. I. Div. 3. a. 595. One-flowered, *uniflora*, comprehending one flower. 596. Two-flowered, *biflora*. Three-flowered, *triflora*. Many-flowered, *multiflora*, including many flowers.
- b. 597. One-valved, *univalvis*, consisting of one scale. 598. Two-valved, *bivalvis*, consisting of two scales. 599. Many-valved, *multivalvis*, consisting of more than two scales.
- c. 600. Coloured, *colorata*, (218). 601. Smooth, *glabra*, (215). 602. Hispid, *hispida*, (243).
- d. 603. Awned, *aristata*, furnished with an awn. 604. Awnless, *mutica*, without an awn. 606. AWN, *arista*, a subulate dagger fixed on the glume. See Vol. II. Pl. I. Div. 3. 607. Terminating, *terminalis*, fixed to the top of the glume. 608. Dorsal, *dorsalis*, fixed on the outside of the glume. 609. Straight, *recta*, going off perpendicularly. 610. Twisted, *tortilis*, twisted like a cord. 611. Genuiculate, *geniculata*, (45). 612. Recurved, *recurvata*, (138).
- d. 613. AMENT, *amentum*, (462). 614. Scaly, *squamosum*, (60). 615. Naked, *nudum*.
- e. 616. SPATHE, *spatha*, a calyx bursting longitudinally. 617. One-valved, *univalvis*, opening on one side. Pl. VI. fig. 1. a. 618. Halved, *dimidiata*, investing the fructification only on the inner side. 619. Two-valved, *bivalvis*, opening on two sides.
- f. 620. CALYPTRE, *calyptra*, the calyx of a Moss; cowled, placed upon the anther (capsule). See Pl. IX. fig. 24. B. a. 621. Straight, *recta*, on every side equal. 622. Oblique, *obliqua*, bent on one side.

g. 623. **VOLVE**, or **Curtain**, *volva*, the membranous calyx of a Fungus. Pl. IX. f. 24. D. b.

624. **Approximate**, *approximata*, near the head, or pileus.

625. **Very remote**, *remotissima*, distant from the head, or pileus.

2. 626. **COROL**, *corolla*, the inner bark, or *liber* of the plant, present in the flower. Pl. VI. fig. 2, 3, &c.

627. **One-petalled**, or **monopetalous**, *monopetala*, consisting of one petal (629). **Two-petalled**, or **Dipetalous**, *dipetala*, &c. &c. according to the number of petals.

628. **Many-petalled**, or **polypetalous**, *polypetala*, consisting of many petals.

a. 629. **PETAL**, *petalum*, in a monopetalous flower is the same as the corol. In a two, three, or many-petalled flower it is one of the parts, into which the corol is divided.

a. **PARTS of the Corol.**

630. **Tube**, *tubus*, the lower part of a one petalled corol. Pl. VI. f. 4. a.

631. **Claw**, *unguis*, the lower part of a many-petalled corol, fixed to the receptacle. Pl. VI. f. 4. a.

632. **Limbus**, *limbus*, the upper dilated part of a one-petalled corol. Pl. VI. f. 4. b.

633. **Lamina**, *lamina*, the upper spreading part of a many-petalled corol. Pl. VI. f. 8. b.

Obs. Linnaeus has not been quite exact in the use of the term *Limbus*, having sometimes employed it for the dilated part of a many-petalled corol.

b. **DIVISIONS.**

634. **Bifid**, *bifida*, (183). **Three-cleft**, *trifida*. **Five-cleft**, *quinquefida*, &c. **Many-cleft**, *multifida*.

635. **Two-parted**, *bipartita*, (186). **Three-parted**, *tripartita*, &c.

636. **Laciniated**, *laciniata*, divided into segments,

c. **EQUALITY, &c.**

637. **Regular**, *regularis*, equal in the figure, magnitude, and proportion of the parts.

638. **Irregular**, *irregularis*, the parts of the Limbus, or Lamina differing in figure, magnitude, and proportion.

639. **Unequal**, *inaequalis*, when the parts correspond in proportion, but not in size.—*Aequalis* does not differ from *regularis*.

640. **Difform**, *difformis*, when the petals or their segments are of different forms.

18 BOTANICAL TERMS, &c. Fructification. Corol.

d. FIGURE.

641. Globular, *globosa*, resembling a globe.
642. Campanulate, *campanulata*, bell-shaped, ventricose (509), without a tube. Pl. VI. f. 2.
643. Funnel-shaped, *infundibuliformis*, conical, fixed upon a tube. Pl. VI. f. 3.
644. Hypocrateriform, *hypocrateriformis*, flat, fixed upon a tube. Pl. VI. f. 4.
645. Rotate, *rotata*, wheel-shaped, flat, without a tube. Pl. VI. fig. 14.
646. Glass-shaped, *cyathiformis*, the tube dilated a little above.
647. Urceolate, or pitcher-shaped, *urceolata*, somewhat globular, gibbous, open at the end.
648. Ringent, *ringens*, irregular, gaping with two lips. Pl. VI. fig. 11.
649. Helmet of a ringent corol, *galea ringentis corollæ*, the upper lip. Pl. VI. f. 11. a.
650. Lip, *labium*, is frequently used to denote the lower lip. Pl. VI. f. 11. b.
651. Throat, *faux*, the opening between the segments of the corol, at the termination of the tube (in one-petalled flowers). Pl. VI. f. 11. d.
652. Closed, *clausa*, the throat stopped by hairs, converging scales, or valves, disposed in the form of an arch.
653. Arched, *fornicata*, closed by arches.
654. Narrowed, *angustata*, or *coarctata*, the throat more contracted than the tube.
655. Naked, *nuda*, neither stopped by hairs nor valves.
656. Pervious, *pervia*, not closed.
657. Gape, *rictus*, the opening between the two lips.
658. Personate, *personata*, ringent (648) but with the palate closed. Pl. VI. f. 13.
659. Crossed, or Cruciform, *cruciata*, spreading with four equal petals. Pl. VI. f. 8.
660. Concave, *concava*, (248).
661. Spreading, *patens*, the laminae fixed on the claws at an acute angle.
662. Papilionaceous, *papilionacea*, irregular, consisting of a keel, standard, and wings. Pl. VI. f. 15.
663. Keel, *carina*, the lowest petal, boat-shaped. Pl. VI. f. 15. b.
664. Standard, *vexillum*, the upper petal, ascending. Pl. VI. f. 15. d.
665. Wings, *alæ*, the lateral petals. Pl. VI. f. 15. c.

666. Rosaceous, or Rose-like, *rosacea*, the petals concave, and disposed in a ring.

667. Undulated, *undulata*, (252).

668. Plaited, *plicata*, (251).

669. Revolute. *revoluta*, (139).

670. Twisted, *torta*, bent to one side.

e. MARGIN.

671. Crenate, *crenata*, (194).

672. Serrated, *serrata*, (195).

673. Ciliate, *ciliata*, (196).

f. SURFACE.

674. Villous, *villosa*, (72).

675. Tomentous, *tomentosa*, (71).

676. Silky, *sericea*, (238).

677. Hairy, *pilosa*, (241).

678. Bearded, *barbata*, (240).

679. Beardless, *imberbis*, opposed to 678.

680. Crested, *cristata*, &c. &c.

g. PROPORTION.

681. Very long, *longissima*, several times longer than the calyx.

682. Very short, *brevissima*, not as long as the calyx.

h. SITUATION.

683. Superior, *supera*, (577).

684. Inferior, *infera*, (578).

i. DURATION.

685. Caducous, *caduca*, continuing only till the expansion of the flower, and then falling off.

686. Deciduous, *decidua*, falling off with the flower.

687. Persisting, *persistens*, remaining till the fruit be mature.

688. Shrivelling, *marcescens*, persisting, but in a withered state.

k. COMPOSITION.

689. Compound, *composita*, consisting of several florets within a common perianth, upon a common receptacle.

690. Ligulate, *ligulata*, all the corollets of the florets flat towards the end (the base only being tubular). Pl. VII. f. 10.

691. Tubular, *tubulata*, all the corollets of the florets tubular, nearly equal. Pl. VII. f. 8.

692. Radiate, *radiata*, the corollets of different forms, viz. of the disk or centre, tubular; of the ray, or circumference, ligulate. Pl. VII. f. 9.

30 BOTANICAL TERMS, &c. Fructification. Nectary.

1. COLOUR.

693. White, *alba*, &c. &c. See Colour.

b. NECTARY, *nectarium*, the honey-bearing part proper to the flower. Pl. VI. f. 22.

a. 695. Proper, *proprium*, distinct from the petals and other parts.

b. 696. Petaline, *petalinum*, inserted in the petals.

697. Calycine, *calycinum*, fixed on the calyx.

698. Stameneous, *stamineum*, adhering to the stamen.

699. Pistillaceous, *pistillaceum*, inserted in the Germen.

700. Receptacular, *receptaculaceum*, attached to the receptacle.

c. 701. Spurred, Spur-shaped, or Horn-shaped, *calcaratum*, *corniculatum*, s. *cornutum*, shaped like a horn, or the spur of a cock.

702. Purse-like, *scrotiforme*, somewhat globular, with a depressed line in the middle.

703. Ovate, *ovatum*, (160).

704. Turbinate, *turbinatum*, (58).

705. Keeled, *carinatum*, (260).

3. 706. STAMEN, *stamen*, an organ for the formation of the pollen. Pl. VI. f. 79.

a. 707. FILAMENT, *filamentum*, the part elevating, and connecting the anther.

a. NUMBER.

One, *unicum*, to twenty or more.

b. FIGURE.

708. Capillary, *capillare*, slender as a hair.

709. Flat, *planum*, with an equal surface.

710. Cuneiform, *cuneiforme*, (164).

711. Spiral, *spirale*, ascending in a spiral line.

712. Subulate, *subulatum*, (269).

713. Emarginate, *emarginatum*, (205).

714. Reflected, *reflexum*, (558).

715. Laciniated, *laciniatum*, (191).

716. Toothed, *dentatum*, having toothlets.

717. Mutilated, *mutilatum*, with the rudiment only of a filament.

718. Castrated, *castratum*, elevating a barren anther, or none at all.

c. INSERTION.

719. Opposite to the calyx, *calyci opposita*, opposite to the leaflets or segments of the calyx.

720. Alternate with the calyx, *calyci alterna*, placed alternately with the leaflets or segments of the calyx.

721. Corolline, or On the corol, *corollina*, s. *corollæ inserta*, inserted in the corol.

722. Calycine, or On the calyx, *calycina* s. *calyci inserta*, inserted in the calyx.

723. Receptacular, or On the receptacle, *receptaculacea*, s. *receptaculo inserta*, inserted in the receptacle.

724. Nectarine, or On the nectary, *nectarina*, s. *nectario inserta*.

725. On the style, *stylo inserta*, gynandrous.

d. PROPORTION.

726. Equal, *æqualia*, all of the same length.

727. Unequal, *inæqualia*, some larger than others.

728. Connate, *connata*, conjoined into one body (so as to form a tube at the base).

729. Very long, *longissima*, longer than the corol.

730. Very short, *brevissima*, much shorter than the corol.

731. As long as the corol, *longitudine corollæ*.

732. As long as the calyx, *longitudine calycis*.

e. SURFACE.

733. Hairy, *pilosum*, (241).

734. Villous, *villosum*, (72).

735. Hirsute, *hirsutum*, &c.

f. STRUCTURE.

736. Membranous, *membranaceum*, (78).

737. Nectariferous, *nectariferum*.

g. DIRECTION.

738. Erect, *erectum*, (129).

739. Spreading, *patens*, (133). Somewhat spreading, *patentiusculum*. Very much spreading, *patentissimum*.

740. Bowed, *arcuatum*, bent in the form of a bow.

741. Converging, *connivens*, approaching the others with the point.

742. Reflected, *reflexum*, (106).

743. Declined, *declinatum*, (36).

744. Inflected, *inflexum*, (136).

745. Flaccid, *flaccidum*, (428).

746. Assurgent, *assurgens*, (135).

747. Ascending, *ascendens*, (35).

748. Recurved, *recurvum*, (138).

749. Incurved, *incurvum*, (37,) &c. &c.

h. 750. ANTHER, *anthera*, a part of the flower containing the pollen; and, when mature, bursting and scattering it.

82 BOTANICAL TERMS, &c. Fructification. Anther.

a. NUMBER with regard to the filaments.

751. Single, *unica*, one on each filament. One on three filaments. One on five filaments.
752. Two, *duæ*, on each filament, &c. &c.

b. FIGURE.

753. Oblong, *oblonga*, (162).
754. Globular, *globosa*, (11).
755. Sagittate, *sagittata*, (179).
756. Angular, *angulata*, &c. (53).
757. Horned, *cornuta*. Two-horned, *bicornis*, &c.
758. Linear, *linearis*, (169).
759. Acute, *acuta*, (209). Rather acute, *acutiuscula*, &c.
760. Cordate, *cordata*, (176).
761. Ovate, *ovata*, (160).
762. Hastate, *hastata*, (180).
763. Two-lobed, *biloba*, (184).
764. Reniform, *reniformis*, (177).
765. Bifid, *bifida*, (183).
766. Two-parted, *bipartita*, (186).
767. Awned, *aristata*, ending in an awn. (606).
768. Bristle-bearing, *setifer s. in setam desinens*, ending in a bristle.
769. Beaked, or Rostrate, *rostrata*, ending in a filiform beak.
770. Truncated, *truncata*, (208).
771. Obtuse, *obtusa*, (204).
772. Emarginate, *emarginata*, (205).
773. Acuminate, *acuminata*, (210).
774. Forked, *furcata*, divided at the end, and diverging.

c. DIRECTION.

775. Erect, *erecta*, (30).
776. Rigid, *rigida*, (32).
777. Spreading, *patens*, (93).
778. Assurgent, *assurgens*, (135).
779. Inflected, *inflexa*, (136).
780. Nodding, *nutans*, (38).
781. Declined, *declinata*, (36).
782. Pendulous, *pendula*, (430).
783. Incurved, *incurva*, (37).
784. Converging, *connivens*, (741).
785. Twisted spirally, *spiralter contorta*.

d. INSERTION.

- 786 Sessile, *sessilis*, (150).
787. Versatile, *versatilis*, incumbent (794), but freely moveable.

788. Adnate, *adnata*, (151).
 789. Distinct, *distincta*, not cohering with other anthers.
 790. Connate, *connata*, several joined into one. Pl. VI. fig. 15. *e*.
 791. Cylindrical, *cylindracea*, formed into a cylinder or equal tube.
 792. Tubular, *tubulata*, coalesced so as to form a tube. Pl. VI. f. 17. *c*. and 18. *d*.
 793. Cohering, *coherentes*, at the base, apex, &c.
 794. Incumbent, *incumbens*, fixed by the middle upon the filament. Pl. VI. f. 7. *f*. *g*.
 795. Lateral, *lateralis*, connected by the whole side to the filament.

e. SUBSTANCE.

796. Membranous, *membranacea*, (78).
 797. Depressed, *depressa*, (258).
 798. Compressed, *compressa*, (51).
 799. Convex, *convexa*, (249).
 800. Flat, *plana*, (709).
 801. Furrowed, *sulcata*, (67). transversely, *transversim*; longitudinally, *longitudinaliter*.
 802. Subulate, *subulata*, (269).
 803. Bilamellated, *bilamellata*, with two membranous plates.

f. MEASURE.

804. Shorter than the filaments, *filamentis brevior*.
 805. Shorter than the corol, *brevior corolla*.
 806. As long as the filament, &c. *longitudine filamenti*, &c.
 807. Longer than the filaments, *filamentis longior*, &c.
 808. Equal, *æquales*, of the same size with one another.
 809. Unequal, *inæquales*, of different sizes.
 810. Very long, *longissima*, much longer than the filament.
 811. Very short, *brevissima*, much shorter than the filament.

g. PLACE.

812. Covered, *lecta*, concealed by a scale of the arch in the *Asperifolia*, Rough-leaved Plants.
 813. Inclosed, *inclusa*, situated within the throat.
 814. Naked, *nuda*, neither covered nor inclosed.

h. CELLS and APERTURE.

815. One-celled, *unilocularis*.
 816. Two-celled, *bilocularis*, &c.
 817. Two-valved, *bivalvis*.
 818. Didymous, *didyma*, gibbous outwardly with two protuberances.

34 BOTANICAL TERMS, &c. Fructification. Anther.

819. Barren, *sterilis*, not forming pollen.

820. Deflorate, *deflorata*, having excluded the pollen.

821. Fertile, *fecunda*, replete with pollen.

822. Opening at the top, *apice dehiscens*.

side, *latere dehiscens*.

2. SITUATION, on the top, side, &c. of the filaments; on the corol, nectary, pistil, or receptacle.

823. Pollen, *pollen*, the powder of the anther, bursting by moisture, and throwing off elastick atoms, *favilla*.— Pollen, when viewed in the microscope, is found to be very various in its forms, e. g. an echinated globe in *Helianthus*, perforated in *Geranium*; didymous in *Symphytum*; rotate and dentate in *Malva*; angular in *Viola*; reniform in *Narcissus*; like a roll of parchment in *Borago*. Pl. VI. f. 7. h.

4. 824. PISTIL, *pistillum*, an organ adhering to the fruit, for the reception of the pollen. Pl. VI. f. 10.

a. 825. GERMEN, *germen*, the rudiment of the immature fruit in the flower. Pl. VI. f. 7. b.

a. NUMBER.

One—Five—numerous, *unum—quinque—plura*.

b. FIGURE.

826. Roundish, *subrotundum*, (158).

827. Ovate, *ovatum*, (160).

828. Oblong, *oblongum*, (162).

829. Turbinate, *turbinatum*, (586).

830. Conical, *conicum*, in the form of a cone.

831. Linear, *lineare*, (169).

832. Cordate, *cordatum*, (176).

833. Obcordate, *obcordatum*, &c.

834. Globular, *globosum*, (11).

835. Cleft, *fissum*. Bifid, *bifidum*. Three-cleft, *trifidum*, (183).

836. Parted, *partitum*, (186). Two-parted, *bipartitum*, &c. &c.

837. Angular, *angulatum*, (53). Triangular, *triangulare*, &c. &c.

838. Didymous, *didymum*, capsule projecting outwardly with two protuberances.

839. Compressed, *compressum*, (51).

840. Acute, *acutum*, (209).

841. Beaked, *rostratum*, (769).

842. Subulate, *subulatum*, (269).

c. SURFACE.

843. Rough, *scabrum*, (69).

844. Villous, *villosus*, (72).

845. Imbricated, *imbricatum*, (61).

d. PLACE.

846. Superior, *superum*, included in the corol.

847. Inferior, *inferum*, placed beneath the corol.

e. INSERTION

848. Sessile, *sessile*, (150).

849. Pedicelled, *pedicellatum*. standing on a pedicel.

850. Sitting on a bristle, *setæ insidens*.

f. MEASURE.

851. Very small, *minimum*, in proportion to the corol.

852. As long as the stamens, calyx, nectary, *longitudine staminum, calycis, nectarii*.

b. 853. STYLE, *stylus*, part of the pistil elevating the stigma from the germen. Pl. VI. f. 7. c.

a. NUMBER.

One—twelve—numerous, *unus—duodecim—plures*.

b. PROPORTION.

854. Very long, *longissimus*, with respect to the stamens.

855. Very short, *brevissimus*.

856. As long as the stamens, *longitudine staminum*.

857. As thick as the stamens, *crassitie staminum*.

858. Thick, *crassus*, with respect to the stamens.

859. Slender, *tenuis*, with respect to the stamens.

c. DIVISION.

860. Simple, *simplex*, (81).

861. Bifid, *bifidus*, &c. (183).

862. Two-parted, *bipartitus*, &c. (186).

d. FIGURE.

863. Columnar, *teres*, (49).

864. Cylindrical, *cylindricus*, (510).

865. Capillary, *capillaris*, (708).

866. Clubshaped, *clavatus*, (292).

867. Subulate, *subulatus*, (269).

868. Winged, *alatus*, (291).

869. Four-cornered, *tetragonus*.

870. Ensiform, *ensiformis*, (268).

871. Pubescent, *pubescens*, covered with pubescence.

872. Villous, *villosus*, (72).

e. DIRECTION.

873. Erect, *erectus*, &c. &c. See Stamens, 701—712.

f. SITUATION.

— On the top of the germen. *In apice germinis*.

— At the side of the *germen*. *Ad latus germinis*, in *Icosandra Polygynia*.

g. DURATION.

874. Persisting, *persistens*, remaining till the fruit be mature.

875. Deciduous, *deciduus*, falling off after the efflorescence.

c. 876. STIGMA, *stigma*, the summit of the pistil, moist with a fluid.

a. NUMBER.

One, *unicum*. Two, *duo*, &c.

b. DIVISION.

877. Simple, *simplex*.

878. Cleft, *fissum*. Two-cleft, *bifidum*, &c. &c.

879. Parted, *partitum*. Two-parted, *bipartitum*, &c. &c.

880. Lobed, *lobatum*. Two-lobed, *bilobum*, &c. &c.

c. FIGURE.

881. Capitate, *capitatum*, approaching in form to a globe, at the top.

882. Globular, *globosum*, (11).

883. Urceolate, *urceolatum*, pitcher-shaped.

884. Ovate, *ovatum*, (160).

885. Obtuse, *obtusum*, (204).

886. Truncated, *truncatum*, (208).

887. Obliquely depressed, *oblique depressum*.

888. Emarginate, *emarginatum*, (205).

889. Flat, *planum*, (246).

890. Reniform, *reniforme*, (177).

891. Orbicular, *orbiculatum*, (159).

892. Peltate, *peltatum*, (149).

893. Crown-shaped, *coroniforme*,

894. Cruciform, *cruciforme*, in the form of a cross.

895. Stellate, *stellatum*, (128).

896. Channelled, *canaliculatum*, (247).

897. Concave, *concavum*, (248).

898. Umbilicate, *umbilicatum*, concave, orbicular.

899. Plaited, *plicatum*, (251).

900. Radiate, *radiatum*, marked with striated rays diverging from the centre.

901. Angular, *angulatum*, (53).

902. Striated, *striatum*, (66).

903. Feathery, *plumosum*, (365).

904. Pubescent, *pubescens*, (871).

905. Filiform, *filiforme*, (441).

906. Capillary, *capillare*, (708).

- 907. Convolute, *convolutum*, (354).
- 908. Revolute, *revolutum*, (139).
- 909. Bent to the left, *flexum sinistrorsum*, &c.
- 910. Bearded, *barbatum*, (240).
- 911. Beardless, *imberbe*, (679).

d. MEASURE.

- 912. As long as the style, *longitudine styli*, &c.

e. EXPANSION.

- 913. Fimbriate-curved, *fimbriato-crispum*.
- 914. Foliateous, or Leaf-like, *foliaceum*, (371).
- 915. Cowled, *cucullatum*, (250).

f. DURATION.

- 916. Persisting, *persistens*, remaining till the fruit be mature.
- 917. Shrivelling, *marcescens*, remaining, but becoming withered.

- 5. 918. PERICARP, *pericarpium*, an organ of the plant filled with seeds, and scattering them when ripe. Pl. VIII. fig. 1, 2, 3, &c.

- a. 919. CAPSULE, *capsula*, a hollow pericarp opening in a determinate manner. Pl. VIII. f. 4.

a. FIGURE and SUBSTANCE, &c.

- 920. Turbinate, *turbinata*, (586).
- 921. Inflated, *inflata*, (559).
- 922. Globular, *globosa*, (11).
- 923. Didymous, *didyma*, (818).
- 924. Purse-like, *scrotiformis*, elevated with two protuberances.
- 925. Cylindrical, *cylindracea*, (49).
- 926. Columnar, *columnaris*, cylindrical and capitate.
- 927. Ovate, *ovata*, (160).
- 928. Roundish, *subrotunda*, (158).
- 929. Oblong, *oblonga*, (162).
- 930. Obcordate, *obcordata*, inversely cordate.
- 931. Obtuse, *obtusa*, (204).
- 932. Acuminate, *acuminata*, (210).
- 933. Ventricose, *ventricosa*, oblong, very convex.
- 934. Compressed, *compressa*, (51).
- 935. Membranous, *membranacea*, (78).
- 936. Elastic, *elastica*.
- 937. Triquetrous, *triquetra*, (55).
- 938. Four-cornered, *tetragona*, &c.
- 939. Three-furrowed, *trisulca*, (226), &c.
- 940. Three-lobed, *triloba*, &c. (184).

38 BOTANICAL TERMS, &c. Fructification. Capsule.

- 941. Five-toothed, *quinquedentata*.
- 942. Crowned, *coronata*, the extremity furnished with leaflets, digested into a crown.
- 943. Cut round, *circumscissa*, cut, or bursting all round horizontally.
- 944. Jointed, *articulata*, intercepted with joints.
- 945. Coriaceous, *coriacea*, resembling leather.
- 946. Fleshy, *carnosa*, resembling flesh.
- 947. Woody, *lignosa*, of a woody texture.

b. PARTS.

- 948. Valve, *valva* s. *valvula*, the coat or covering of the fruit; according to the number of valves a Capsule is
- 949. Two-valved, *bivalvis*. Three-valved, *trivalvis*, &c. &c.
- 950. Cell, *loculamentum*, a hollow chamber for the seeds; according to the number of cells a Capsule is
- 951. One-celled, *unilocularis*. Two-celled, *bilocularis*. Three-celled, *trilocularis*, &c. Many-celled, *multilocularis*. Pl. VIII. f. 10.
- 952. Dicoccous, or Two-grained, *dicocca*. Tricoccous, or Three-grained, *tricocca*. Pentacoccous, or Five-grained, *pentacocca*.—A tricoccous capsule is one with three knots, or protuberances, and divided within into three cells, each containing one seed.
- 953. Dissepiment, *dissepimentum*, the partition by which the seeds are collected in distinct chambers. Pl. VIII. fig. 10. b. b.
- 954. Column, *columella*, the central pillar in a capsule. Pl. VIII. f. 10. c.
- b. 955. SILIQUE, *siliqua*, a two-valved pericarp, with the seeds fixed along both sutures. Pl. VIII. f. 1, and 30.

Obs. In a more strict sense a *Siliqua* is very long with scarcely any style, observable at its extremity. And a *Silicle* is roundish, and furnished with a style, which is often longer than the silicle.

a. FIGURE.

- 956. Compressed, *compressa*, (51).
- 957. Torose, *torosa*, or Torulose, *torulosa*, having protuberances here and there.
- 958. Jointed, *articulata*, intercepted with tight knots.

b. DISSEPIMENT.

- 959. Parallel, *dissepimentum parallelum*, approaching the valves by its breadth and transverse diameter (placed in the same direction with the valves). Pl. VIII. fig. 6. b.

960. Transverse, *transversum dissep.* narrower, the tightened valves becoming concave (running across from one valve to the other). Pl. VIII. f. 5. b.

c. 961. LEGUME, *legumen*, a two-valved pericarp, with the seeds fixed along one suture only. Pl. VIII. f. 29.

a FIGURE, SUBSTANCE, &c.

962. Roundish, *subrotundum*, (158).

963. Ovate, *ovatum*, (160).

964. Oblong, *oblongum*, (162).

965. Linear, *lineare*, (169).

966. Rhombed, *rhombeum*, (174).

967. Rhomboidal, *rhomboidale*, of a rhomboid form.

968. Crescent-shaped, *lunulatum*, (178).

969. Awnless, *muticum*, without a point.

970. Obtuse, *obtusum*, (204).

971. Acuminate, *acuminatum*, (210).

972. Mucronate with a thorn, *spina mucronatum*, (212).

973. Venoso-reticulated, *venoso-reticulatum*, the veins disposed so as to form a network.

974. Venoso-varicose, *venoso-varicosum*, the veins dilated so as to form varices.

975. Striated, *striatum*, (66).

976. Villous, *villosum*, (72).

977. Tubercled, *tuberculatum*, covered with cartilaginous points.

978. Rough, *scabrum*, (69).

979. Flat, *planum*, (246).

980. Membranous, *membranaceum*, (78).

981. Foliaceous, *foliaceum*, (371).

982. Diaphanous, *diaphanum*, transmitting the rays of light.

983. Coriaceous, *coriaceum*, (945).

984. Gibbous, *gibbum*, (256).

985. Columnar, *teres*. Somewhat columnar, *teretiusculum*.

986. Cylindrical, *cyldraceum*, (49).

987. Winged, *alatum*, (291).

988. With membranous angles, *angulis membranaceis*.

989. Compressed, *compressum*, (51).

990. Knotty, *nodosum*, elevated in knots.

991. Inflated, *inflatum*, (559).

992. Turgid, *turgid*, swoln, but not hollow like a bladder.

993. Torose, *torosum*, or necklace-form, gibbous, with protuberances disposed linearly.

994. Stuffed, *farctum*, full of a pulpy or fleshy substance.

995. Pulpy, *pulposum*, filled with a pulp.

996. Fleshy, *carnosum*, filled with a fleshy substance.

40 BOTANICAL TERMS, &c. Fructification. Legume.

- 997. Woody, *lignosum*, (947).
- 998. Subulate, *subulatum*, (269).
- 999. Falcate, or Sickle-shaped, *falcatum*, compressed, subulate, curved.
- 1000. Sessile, *sessile*, (150).
- 1001. Pedicelled, *pedicellatum*, elevated on a pedicel.
- 1002. Straight, *rectum*, without bending.
- 1003. Stiff and straight, *strictum*, (31).
- 1004. Rigid, *rigidum*, (32).
- 1005. Ascending, *ascendens*, with an ascending point.
- 1006. Incurved, *incurvatum*, (37).
- 1007. Bowed, *arcuatum*, bent like a bow.
- 1008. Inflected, *inflexum*, (136).
- 1009. Reflected, *reflexum*, (106).
- 1010. Revolute, *revolutum*, (139).

b. MEASURE.

- 1011. Very long, *longissimum*, with respect to the corol.
- 1012. Long, *longum*.
- 1013. Very large, *maximum*.
- 1014. Very small, *minimum*.
- 1015. Very broad, *latissimum*.

c. STRUCTURE.

- 1016. Jointed, *articulatum*.
- 1017. One-celled, *uniloculare*. Two-celled, *biloculare*.
- 1018. Intercepted with isthmuses, *isthmis interceptum*, divided transversely within into different cells.

- d. 1019. FOLLICLE, *folliculus*, a one-valved pericarp, opening longitudinally on one side, the seeds not fixed to the suture. (Formerly called a conceptacle, *conceptaculum*.) Pl. VIII. f. 7.

Obs. The *Contortæ* have chiefly this kind of a Pericarp.

- e. 1020. DRUPE, *drupa*, a stuffed valveless pericarp containing a nut. Pl. VIII. f. 9.
- 1021. Succulent, *succulenta*, juicy, containing a fluid.
- 1022. Dry, *sicca*, juiceless, opposed to the preceding.
- f. 1023. POME, *pomum*, a stuffed valveless pericarp, containing a Capsule. Pl. VIII. f. 8.

a. FIGURE.

- 1024. Oblong, *oblongum*, (162).
- 1025. Ovate, *ovatum*, (160).
- 1026. Globular, *globosum*, (11).
- 1027. Roundish, *subrotundum*, (158), &c. &c.

b. CELLS.

1028. Three-celled, *trilocularis*, &c. &c.

g. 1029. BERRY, *bacca*, a stuffed valveless pericarp, containing seeds in other respects naked. Pl. VII. f. 12.

1030. One-seeded, *monosperma*. Two-seeded, *disperma*, &c. according to the number of seeds.

Obs. The Seeds, which are dispersed through the pulp, are styled *nidulant*, *nidulantia*.

h. 1031. STROBILE, *strobilus*, a pericarp formed from an ament, the scales becoming indurated. Pl. VI. f. 5.

a. FIGURE.

— Of the Strobile, } to be noticed.
— Of the Scales, }

6. 1032. SEED, *semen*, the rudiment of the new plant.

a. NUMBER.

— One, *unicum*, two—twelve, numerous, &c.

b. FIGURE.

1033. Roundish, *subrotundum*, (158).

1034. Ovate, *ovatum*, (160).

1035. Oblong, *oblongum*, (162).

1036. Scobiform, or Sawdust-like, *scobiforme*, resembling sawdust.

1037. Filiform, *filiforme*, (441).

1038. Turbinate, *turbinatum*, (586).

1039. Clubshaped, *clavatum*, (292).

1040. Angular, *angulatum*, (53).

1041. Cylindrical, *cylindraceum*, (510).

1042. Triquetrous, *triquetrum*, (55).

1043. Acerose, *acerosum*, (170).

1044. Columnar, *teres*, (49).

1045. Elliptical, *ellipticum*, (168).

1046. Crescent-shaped, *lunulatum*, (178).

1047. Cordate, *cordatum*, (176).

1048. Reniform, *reniforme*, (177).

1049. Orbicular, *orbiculatum*, (159).

1050. Globular, *globosum*, (500).

1051. Arilled, *arillatum*, furnished with an aril. (1102).

1052. Flat, *planum*, (246).

1053. Flat on one side, round on the other, *hinc planum, inde rotundatum*.

1054. Round on one side, angular on the other, *hinc rotundatum, inde angulatum*.

42 BOTANICAL TERMS, &c. Fructification. Seed.

- 1055. Compressed, *compressum*, (51).
- 1056. Gibbous, *gibbum*, (256).
- 1057. With membranous angles, *angulis membranaceis*.
- 1058. Acuminate, *acuminatum*, (210).
- 1059. Obtuse, *obtusum*, (204).
- 1060. Rostrate, *rostratum*, (769).
- 1061. Erect, *erectum*, (30).
- 1062. With membranous margins, *marginibus membranaceis*.
- 1063. Emarginate, *emarginatum*, (205).
- 1064. Tailed, *caudatum*, terminated by a naked or feathery filament.
- 1065. Keeled, *carinatum*, (260).
- 1066. Scaly, *squamatum*, (60).

c. CELLS.

- 1067. Two-celled, *biloculare*, &c. &c.

d. SURFACE.

- 1068. Smooth, *glabrum*, (68).
- 1069. Rough, *scabrum*, (69).
- 1070. Shining, *nitidum*, (216).
- 1071. Wrinkled, *rugosum*, (228).
- 1072. Striated, *striatum*, (66).
- 1073. Furrowed, *sulcatum*, (67).
- 1074. Rough-haired, *hirtum*.
- 1075. Villous, *villosum*, (72).
- 1076. Hispid, *hispidum*, (73).
- 1077. Woolly, *lanatum* s. *lana tectum*, (239).
- 1078. Coated, *tunicatum*, (64).

e. SUBSTANCE,

- 1079. Fungous, *fungosum*.
- 1080. Succulent, *succulentum*, (1021.)
- 1081. Fleshy, *carnosum*, (264.)
- 1082. Chaffy, *paleaceum*.
- 1083. Coriaceous, *coriaceum*, (945.)
- 1084. Berried, *baccatum*.
- 1085. Cartilaginous, *cartilagineum*, (199.)
- 1086. Bony, *osseum*.

f. PARTS of the Seed, &c.

- 1087. Eye, *hilum*, the external scar of a seed where it was fixed to the fruit.
- 1088. Corcle, *corculum*, the rudiment of the new plant within the seed.
- 1089. Plumule, *plumula*, the scaly ascending part of the corcle.

1090. Rostel, *rostellum*, the simple descending part of the corcle.
1091. Cotyledon, *cotyledon*, the lateral bibulous body of the seed, falling off.
1092. Crown, *corona*, a calycle adhering to the upper part, whereby it flies.
1093. Pappus, *pappus*, a feathery or hairy crown, Pl. VI. f. 19, 20, &c.
1094. Stipitate, *stipitatus*, furnished with a stipe (stipes), or thread connecting the pappus and seed. Pl. VI. f. 20, and 21.
1095. Capillary, *capillaris*, the hairs undivided, (or nearly so. Pl. VI. f. 20.
1096. Feathery, *plumosus*, consisting of feathered hairs. Pl. VI. f. 21.
1097. Tail, *cauda*, a thread terminating the seed.
1098. Hook, *hamus*, the pubescence, whereby it adheres to animals.
1099. Calycle, *calyculus*, the proper cover (or crown) of the seed.
1100. Aril, *arillus*, the outer proper coat of the seed, falling off spontaneously.
1101. Wing, *ala*, the membrane affixed to a seed, whereby it flies and is disseminated.
1102. Nut, *nux*, a seed covered with a bony cuticle. Pl. VI. f. 9. b. c. One-celled, *unilocularis*, &c. &c.
1103. Kernel, or Nucleus, *nucleus*, the seed included in the nut. Pl. VI. f. 9. c.
1104. Propago, *propago*, the decorticated seed of a Moss.
7. 1105. RECEPTACLE, *receptaculum*, the base which connects the parts of fructification.
1106. Of the fructification, *fructificationis*, common to the flower and fruit.
1107. Of the flower, *floris*, the base on which the parts of the flower are fixed, without the germen.
1108. Of the fruit, *fructus*, the base for the fruit, remote from the receptacle of the flower.
- a. 1109. PROPER, *proprium*, sustaining only the parts of one fructification. Pl. VI. f. 8.
1110. COMMON, *commune*, sustaining many flowers and their fruit. Pl. VI. f. 16.
- a. 1112. Dotted, or Punctate, *punctatum*, sprinkled with hollow points. Pl. VI. f. 16. a.
1113. Hairy, *pilosum*, (241).

44 BOTANICAL TERMS, &c. Fructification. Receptacle.

1114. Chaffy, *paleaceum*, the florets separated by interposed scales, like chaffs.
1115. Naked, *nudum*, neither dotted, hairy, nor chaffy.
- b. 1116. Flat, *planum*. (246).
1117. Convex, *convexum*, (249).
1118. Conical, *conicum*, columnar, attenuated towards the apex.
1119. Subulate, *subulatum*, (269).
1120. Alveolate, or Honey-combed, *alveolatum*.
- b. 1121. COMPOUND FLOWER, *compositus flos*, with an entire dilated receptacle, the florets sessile (460).
- c. 1122. AGGREGATE FLOWER, *aggregatus flos*, the receptacle dilated, the florets somewhat petioled (459).
- d. 1123. UMBEL, *umbella*, a receptacle from the same centre elongated into proportionate filiform peduncles (453).
Pl. VII. f. 5.
- a. 1124. Simple, *simplex*, (454).
1125. Compound, *composita*, (455).
1126. Universal, *universalis*, (456).
1127. Partial, *partialis*, (457).
1128. Proliferous, *prolifera*, (458).
- b. 1129. Concave, *concava*, (248).
1130. Fastigate, *fastigiata*, (92).
1131. Convex, *convexa*, (249).
1132. Erect, *erecta*, (30).
1133. Nodding, *nutans*, (38).
1134. Terminal, *terminalis*, (385).
1135. Axillary, *axillaris*, (113).
1136. Oppositifolious, *oppositifolia*, (323).
- e. 1137. CYME, *cyma*, a receptacle elongated into fastigate peduncles from the same universal centre, but with unequal partial ones (452). Pl. VIII. f. 11.
1138. Bracteate, *bracteata*, (449).
1139. Naked, *nuda*, without bractes.
- f. 1140. RACHIS, *rachis*, a filiform receptacle, connecting the florets longitudinally so as to form a spike.
- g. 1141. SPADIX, *spadix*, the receptacle of a Palm and some other plants, issuing from within a spathe, (451).
- a. 1142. One-flowered, *uniflorus*. Two-flowered, *biflorus*. Many-flowered, *multiflorus*.
- b. 1143. Simple, *simplex*. Pl. VI. f. 1.
1144. Branched, *ramosus*. Pl. VI. f. 6.

III. HABIT.

- A. 1145. GEMMATION, or Budding, *gemma*, the construction of the Bulb, or Bud from leaves, stipules, petioles, or scales.
1. 1146. BULB, *bulbus*, the hybernacle of a plant from the rudiments of past leaves, sitting on the root.
1147. Solid, *solidus*, fleshy within, undivided. Pl. I. f. 6.
1148. Coated, *tunicatus*, one coat upon another. Pl. I. f. 7.
1149. Sealy, *squamatus*, imbricated with scales. Pl. I. f. 8.
1150. Cauline, or Stem, *caulinus*, sitting on the stem, as in some species of *Allium*.
2. 1151. BUD, or Gem, *gemma*, the hybernacle of a plant from the rudiments of future leaves, on the stem or branches.
- a. ORIGIN.
1152. Petiolar, *petiolaris*, consisting of petioles.
1153. Stipular, *stipularis*, consisting of stipules.
1154. Cortical, *corticalis*, consisting of leaves, or scales.
- b. CONTENTS.
1155. Foliar, *foliaris*, including leaves only.
1156. Floral, *floralis*, including flowers only.
1157. Common, *communis*, including both leaves and flowers.
- B. 1158. VERNATION, *vernatio*, the disposition of the leaves within the bud.
1159. Conduplicate, *conduplicata*, the sides of the leaves applied parallel to one another, (the leaves being doubled at the midrib). Pl. VIII. f. 17.
1160. Convolute, *convoluta*, rolled spirally like a cowl. Pl. VIII. f. 14.
1161. Involute, *involuta*, the edges rolled in spirally on both sides towards the upper surface. Pl. VIII. f. 16.
- Involute opposite, *involuta opposita*. Pl. VIII. f. 23.
- alternate, *involuta alterna*, Pl. VIII. f. 24.
1162. Revolute, *revoluta*, the edges rolled in spirally on both sides towards the under surface. Pl. VIII. f. 15.
- Revolute opposite, *revoluta opposita*. Pl. VIII. f. 25.
1163. Imbricated, *imbricata*, the leaflets lying crosswise upon one another in their turns. Pl. VIII. f. 19.
1164. Equitant, *equitans*, converging with their edges in an opposite situation, so that one includes the other. Pl. VIII. f. 18.

Equitant two-edged, *equitans anceps*. Pl. VIII. fig. 26.

—— triquetrous, *equitans triquetra*. Pl. VIII. fig. 27.

1165. Obvolute, *obvoluta*, the upper surface with the sides approximated, so that one side separates the sides of the other leaf.—The margins alternately embracing the straight margin of the opposite leaf. Pl. VIII. fig. 20.

1166. Plaited, *plicata*, the leaf folded into various plaits. Pl. VIII. f. 21.

1167. Circinal, *circinalis*, the leaf rolled in spirally downwards, so that the apex occupies the centre.

C. 1168. ESTIVATION, *æstivatio*, the disposition of the petals within the floral bud.

1169. Convolute, *convoluta*, (1160).

1170. Imbricated, *imbricata*, (61).

1171. Conduplicate, *conduplicata*, (1159).

1172. Valved, *valvata*, when they are placed like the glumes in grasses.

1173. Unequally-valved, *inæquivalvis*, the valves of unequal size.

D. 1174. TWINING, *Torsio*, or *Intorsio*, the bending of the parts of a plant towards one side.—The turning, or twining of any part of a vegetable, in any direction, from the vertical one.

a. 1175. Conform, *conformis*, twisting always the same way.

1176. Difform, *difformis*, twisting first one way, and then another way.

b. 1177. Right, *dextra*, twining to the right.

1178. Left, *sinistra*, twining to the left.

1179. Reciprocal, *reciproca*.

c. 1180. Resupinate, *resupinata*, reversed, the upper lip of the corol facing the earth, and the lower lip the sky.—Or when that, which is usually the upper lip, becomes the lower.

E. 1181. VARIATION, *variatio*, the change which takes place in a plant from an accidental cause, as from Climate, *climate*, Soil, *solo*, Culture, *cultura*, &c.

a. COLOUR.

Of the Flower, *floris*, red into white, blue into white, yellow into white, white into purple, blue into yellow, red into blue.

Of the Leaves, *foliorum*, the leaves becoming variegated with white spots.

Of the Seeds, *seminum*, black into white.

Of the Root, *radicis*, violet into variegated, &c.

b. SIZE.

Of the Plant, *plantæ*.

Of the Root, *radicis*.

Of the Flower, *floris*.

Of the Leaves, *foliorum*.

Of the Fruit, *fructus*.

c. PUBESCENCE.

Of the Hairs, *pilorum*.

Of the Tomentum, *tamenti*.

Of the Bristles, *setarum*.

Of the Glands, *glandularum*.

Of the Prickles, *aculeorum*.

Of the spines, *spinarum*.

d. AGE.

Of the Leaves, *foliorum*.

Of the Stem, *caulis*.

Of the Bark, *corticis*.

a. External Variation, *variatio externa*.

a. Of the Stem, *caulis*.

1182. Folded or Plaited, *plicata*, when the branches are so much interwoven that a knot is formed like the Plica Polonica.

1183. Fasciate, *fasciata*, when several of the stems are conjoined into one broad compressed band-like stem.

b. Of the Leaves, *foliorum*.

1184. Broad-leaved, *latifolia*, when in lacinated and slender-leaved plants, many leaflets and segments grow together.

1185. Slender-leaved, *tenuifolia*, when broad-leaved plants are cut into segments and narrow leaves.

γ. Of the Fulcres, *fulcrorum*.

1186. Awnless, *mutica*, when the stem or other parts are deprived of their Thorns, *spinæ*, Pubescence, *pubes*, and Prickles, *aculei*.

b. Internal Variation, *variatio interna*.

a. Of the Fructification, *fructificationis*.

aa. 1187. Mutilated, *mutilata*, the flower not producing a corol, but, nevertheless, perfecting the fruit and seeds.

1188. Large-flowered, *grandiflora*, the corol growing to an unusual size.

bb. 1189. Multiplied, *multiplicata*, when the corol is enlarged by a double, treble, &c. series of petals, the stamens remaining.

1190. Full, *plena*, when the petals are so increased, that the stamens are excluded, or become changed into petals.

1191. Proliferous, *prolifera*, flower arising within flower (oftentimes a full one).

1192. Frondose, *frondosa*, when the offspring of a prolific flower is leafy.

1193. Crested, *cristata*.

cc. 1194. Viviparous, *vivipara*, when the rudiment of the germen grows out into leaves.

1195. Bulb-bearing, *bulbigera*, the rudiment of the germen growing into a bulb.

F. 1196. NUPTIALS, *sponsalia*, the Sexes of Plants, with the mystery of generation.

1197. Male, *mas*, the flowers containing anthers only.

1198. Female, *femina*, the flowers containing stigmas only.

(1199. Hermaphrodite, *hermaphrodita*, bearing flowers which contain both anthers and stigmas.

1200. Androgynous, *planta androgyna*, a plant which supports both male and female flowers, e. g. plants belonging to the Class Monoecia.

G. 1201. Semination, *seminatio*, the dispersion of the mature seeds upon the earth.

Obs. This is performed by the *Air*, by means of stormy winds; by *Water*, by the waves and tides of the Sea, by the course of Rivers, by the motion of water in lakes, by torrents of Rain; moreover many animals contribute to the distribution of seeds. Semination is assisted by certain circumstances attending

a. The SEED.

1202. Tail, *cauda*, woolly.

1203. Wing, *ala*, membranous.

1204. Pappus, *pappus*, feathery, or hairy.

1205. Awn, *arista*, (587).

Obs. These circumstances assist the flying of a seed by increasing the bulk, without adding materially to the weight.

1206. Hook, *hamulus*, acuminate, curved.

1207. Gluten, *gluten*, a viscous substance.

1208. Curvature, *curvatio*.

Obs. By these means the seeds adhere to animals, and are carried to distant places.

b. The PERICARP:

1209. Baccation, *baccatio*, the formation of it into a berry, the pulp assisting the semination.

1210. Inflation, *inflatio*, the increased volume rendering it more easily moved by the air.

1211. Viscosity, *viscositas*, thereby becoming fixed to animals.

1212. Elasticity, *elasticitas*, propelling the seeds by bursting with a sudden forcible motion.

1213. Structure, *structura*, peculiar form, &c.

H. 1214. PLACENTATION, *placentatio*, the disposition of the cotyledons, (1091), during the germination of the seeds.

1215. Acotyledonous, *acotyledones*, plants having seeds without cotyledons.

1216. Propagineous, *propagineæ*. Musci. See (1104).

1217. Monocotyledonous, *monocotyledones*, plants, which have only one cotyledon.

1218. Perforated, *perforatæ*. Gramina.

1219. Unilateral, or One-sided, *unilaterales*. Palmæ.

1220. Reduced, *reductæ*. Cepa.

1221. Dicotyledonous, *dicotyledones*, plants having their seeds furnished with two cotyledons, or seed-lobes.

1222. Unchanged, *immutatæ*; Legumina, &c.

1223. Plaited, *plicatæ*; Gossypium.

1224. Doubled, *duplicatæ*; Malva.

1225. Obvolute, *obvolutæ*; Helxine.

1226. Spiral, *spirales*; Salsola.

1227. Reduced, *reductæ*; Umbellatæ.

1228. Polycotyledonous, *polycotyledones*, plants having more than two cotyledons.

IV. STATION.

A. CLIMATE, *Clima*.

a. Longitude and Latitude.

1230. Northern, *boreale*.

1231. Eastern, *orientale*.

1232. Southern, *australe*.

1233. Western, *occidentale*.

1234. Indian, *indicum*.

b. Elevation.

1235. Marine, *marinum*.

1236. Mediterranean, *mediterraneum*.

1237 Alpine, *alpinum*.

Obs. The terms, relative to climate, are thus explained by Giseke (Term. Bot. p. 112).

Northern comprehends North Europe from Lapland to Paris.

Mediterranean comprehends South Europe, viz. part of France, Portugal, Spain, Italy, Hungary (Greece), Archipelago, Armenia, and Media.

Eastern includes North Asia, Sibiria, part of Tartary, Syria, &c.

Indian comprehends the regions betwixt the tropics in Asia, Africa, and America.

Egyptian (*ægyptiacum*) contiguous to the equinoctial line.

Southern includes the region from Æthiopia to the Cape of Good Hope, Peru, and Brasil.

Western comprehends North America from Canada to Florida, and Japan.

Alpine comprehends the high mountains, covered with snow, in the whole world.

B. SOIL, *Solum*.

- a. 1238. Lacustrian, *lacustre*, having a firm bottom, with sweet pure water.

1239. Shorey, *littorale*, sand impregnated with salt.

1240. Maritime, *maritimum*, the bottom covered with salt water.

1241. Saline, *salsum*, clayey land impregnated with salt.

- b. 1242. Marshy, *palustre*, muddy loose ground, covered with stagnant water in the winter, dry in the summer.

1243. Inundated, *inundatum*, overflowed in the winter, and by showers, with water, which is putrid, and dried up in the summer.

1244. Uliginous, *uliginosum*, spongy, filled with putrid water.

1245. Cespitose, or Turfy, *cæspitosum*, marshy, the mould mixed with Sphagnum, and surrounded by muddy deep water.

- c. 1246. Shady, *nemorosum*, at the foot of a mountain, in places covered with a spongy soil, shaded, moist, not exposed to winds.

1247. Woody, *sylvaticum*, shady, gravelly, barren.

- d. 1248. Meadowy, *pratense*, low lands, and valleys abounding in herbage.

1249. Pasture, *campestre*, dry, exposed to the sun, and winds.

1250. Mountainous, *montanum*, dry, elevated, gravelly, barren.

- e. 1251. Cultivated, *cultum*, mixed, very fertile:

1252. Rubbishy, *rudérale*, near houses, in public roads, and streets.

1253. Fallow, *arvense*, cultivated, and at rest.

C. EARTH, *terra*.

- a. 1254. Mould, *humus*.

1255. Clay, *argilla*.

1256. Chalk, *creta*.

1257. Sand, *arena*.†

† See SOIL in the Dictionary.

- b. 1258. Parasitical, *parasitica*.^{††} Root less, *arrhiza*:
On the Root, Trunk, Stem, Leaf.

V. TIME.

- A. 1259. GERMINATION, *germinatio*, the time required for the appearance of the seed-leaves, after the seeds are committed to the ground.
a. Days, *dierum*. Months, *mensium*, number of.
b. Annual, *annua*. Biennial, *biennis*.
- B. 1260. FRONDESCENCE, *frondescentia*, the time, at which plants unfold their leaves, or drop them.
a. 1261. VERNATION, *vernatio* s. *foliatio*, the time of unfolding the leaves.
1262. Early, *præcox*.
1263. Equal, *æqualis*.
1264. Late, *serotina*.
b. 1265. AUTUMNATION, *autumnatio* s. *defoliatio*, the time, at which plants drop their leaves.
1266. Early, *præcox*.
1267. Slow, *lenta*.
1268. Retarded, *cunctans*.
- C. 1269. CALENDAR, *calendarium*, an account of the times
1. 1270. Of GERMINATION, *germinationis*, spring, when the seeds, after being committed to the earth, are protruded into cotyledons, in each peculiar clime.
1271. Of FRONDESCENCE, *frondescentiæ*, when each species of a plant unfolds its leaves.
1272. Of FLORESCENCE, *florescentiæ*, when each species sends forth its flowers.
2. 1273. Of GROSSIFICATION, *grossificationis*, summer, when, after florescence, the germen grows large (*excrescit in grossum*).
1274. Of MATURATION, *maturationis*, when the fruit ceases to grow, and begins to ripen.
1275. Of HARVEST, *messis*, when the fruit is fully ripe, and may be collected.
3. 1276. Of EXFOLIATION, *exfoliationis*, or of TRANSPLANTATION, *exsolationis*, autumn, when plants may be easily removed from one soil to another.

^{††} Plant seems evidently to be understood in this place: But Forster considers *parasitica* as agreeing with *terra*, and explains the term thus, "particles collected on trees, rocks, &c." *Enchiridion*. p. 116.

1277. Of **DEFOLIATION**, *defoliationis*, when the plants throw down their leaves.

1278. Of **CONGELATION**, *congelationis*, in the Northern, and Southern regions, when water first freezes.

4. 1279. Of **WINTER**, *brumæ*, when all perennial, and biennial plants betake themselves, on account of the cold, to *Hybernacles*, or Winter-quarters.

1280. Of **ICE**, *glaciei*, when the winter is advanced and prevailing.

1281. Of **THAW**, *regelationis*, when, on the return of the sun from the tropics, the cold is mitigated, and the rivers thawed.

D. 1282. **HOROLOGE**, *Horologium*, an account of the vigils and times of opening and shutting of flowers.

1. 1283. **VIGILS**, or Watchings, *vigiliae*, determinate hours of the day, at which the flowers of a plant daily begin to open, expand, and close.

omit 9. 1284. **Meteorical**, *meteoricae*, when flowers do not accurately observe a particular hour of unfolding, but open sooner, or later, according as the day proves shady or otherwise, as the air is moist or dry, and the pressure of the atmosphere is greater or less.

1285. **Tropical**, *tropicae*, when flowers open in the morning, and shut before evening; the hour of unfolding and folding differing, as the days increase or decrease in length.

1286. **Equinoctial**, *æquinociales*, when flowers open at a certain fixed hour of the day; and generally close also at a fixed hour; and are not disturbed by the increase or decrease of the day.

2. 1287. **HOURS** of Opening, *apertionis*. Shutting, *reclusionis*.

E. 1288. **SLEEP**, *somnus*, the different form and appearance assumed by plants during the night, independently of their fructification. It is especially conspicuous in the *Leaves*.

a. *In simple leaves.*

1289. **Converging**, *connivens*, when two opposite leaves are so closely applied to each other, by their upper surfaces, that they appear to be one leaf.

1290. **Including**, *includens*, when alternate leaves are approximated to the stem, so that a flower or branchlet is concealed between them.

1291. Fortifying or Fencing round, *circumsepiciens*, when leaves, which are placed horizontally in the day, become erect in the night, and surround the top of the stem in the form of a funnel.

1292. Fortifying, *muniens*, when the uppermost leaves, which spread out horizontally on long petioles in the day, hang down round about them, so as to form an arch, in the night.

b. In compound leaves.

1293. Conduplicating, *conduplicans*, when the leaflets are approximated, so as mutually to cover their upper surfaces, like the leaves of a book.

1294. Involving, *involvens*, when the leaflets converge at their tips only, leaving a hollow underneath.

1295. Diverging, *divergens*, when the leaflets approach at their bases, and spread out at their tips.

1296. Dependent, *dependens*, when the leaflets hang down.

1297. Inverting, *invertens*, when the more tender surface of the leaves is covered by being inverted.

1298. Imbricating, *imbricans*, when the common petiole is defended by being imbricated.

F. 1299. DURATION, *Duratio*, the continuance of the life of the plant, or of its different parts.

a. PLANTS, *plantæ*.

1300. Caducous, *caducæ*, soon perishing.

1301. Sensitive, *sensiles*, changing the situation of their parts, when touched.

1302. Perpetual, *perpetuæ*, remaining unchanged.

b. FLOWERS, *flores*.

1303. Ephemeral, *ephemeri*, continuing one day.

1304. Triduous, *tridui*, continuing three days.

1305. Menstrual, *menstrui*, continuing a month.

c. FRUITS, *fructus*.

1306. Early, *præcoces*. Late, *serotini*. Annual, *annui*.

VI. QUALITY.

A. 1307. ODOUR, *Odor*, affecting the organ of smell.

1308. Ambrosial, *ambrosiacus*. 1309. Goatish, *hircosus*.

1310. Fragrant, *fragrans*. 1311. Nidorous, *nidorosus*.

1312. Breathing, *spirans*. 1313. Nasty, *teter*.

1314. Aromatic, *aromaticus*. 1315. Nauseous, *nauseosus*.

6. Orgastic, *orgasticus*. 1317. Poisonous, *virosus*.

B. 1318. TASTE, *Sapor*, affecting the nervous fibrils of the tongue.

1319. Watery, *aquosus*.

1320. Dry, *siccus*.

1321. Acid, *acidus*.

1322. Bitter, *amarus*.

1323. Fatty, *pinguis*.

1324. Styptic, *stypticus*.

1325. Sweet, *dulcis*.

1326. Acrid, *acris*.

1327. Mucous, *mucosus*.

1328. Salt, *salsus*.

C. 1329. COLOUR, *Color*, owing to the reflection of the rays of the sun from the surface of the plant, or a part of it; varying according to the surface.

a. 1330. White, *albus*, when all the rays are reflected together.

b. 1331. Black, *niger*, when all the rays are absorbed.

c. 1332. Purple, *purpureus*, very much refracted.

1333. Violet, *violaceus*, arising from the mixture of purple and blue.

d. 1334. Blue, *cæruleus*.

1335. Green, *viridis*, from the mixture of blue and yellow.

e. 1336. Yellow, *luteus*.

1337. Orange, *aurantius*, from the mixture of yellow and red.

f. 1338. Red, *ruber*, very little refracted.

Obs. All the remaining colours arise from the mixture of the six principal ones, and from their intense, saturated, or diluted state.

a. Colours arising from *Intensity*, *Saturation*, *Dilution*.

PRINCIPAL.	INTENSE, OR FLORID.	SATURATED, OR AUSTERE.	EXPANDED, OR DILUTED.
1. White, <i>albus</i> ,	} Snowy, <i>niveus</i> ,	} Full white, <i>candidus</i> ,	} Milky, <i>lacteus</i> .
2. Black, <i>niger</i> ,	} Intensely black, <i>furvus</i> ,	} Full black, <i>ater</i> ,	} Sooty, <i>fuliginosus</i> .
3. Purple, <i>purpureus</i> ,	} Hyacinth, <i>hyacinthinus</i> ,	} Deep purple, <i>hysginus</i> ,	} Rosy, <i>roseus</i> .
4. Blue, <i>cæruleus</i> ,	} Sapphire, <i>sapphirinus</i> ,	} Azure, <i>cyaneus</i> ,	} Sky-blue, <i>cælestis</i> .
5. Yellow, <i>luteus</i> ,	} Bright yellow, <i>flavus</i> ,	} Saffron, <i>croceus</i> ,	} Sulphur-col. <i>sulphureus</i> .
6. Red, <i>ruber</i> ,	} Scarlet, <i>coccineus</i> ,	} Blood-col. <i>sanguineus</i> .	} Miniate, <i>miniatus</i> .

b. Colours arising from the *Mixture* of the principal ones.

3. 4. Violet, <i>violaceus</i> ,	} Steel-col. <i>chalybatus</i> ,	} Deep violet, <i>ianthinus</i> ,	} Amethyst, <i>amethystinus</i> .
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4. 5.	Green, <i>viridis</i> ,	Samaragdine, <i>samaragdinus</i> ,	Glaucous, <i>glaucus</i> ,	Leek-col., <i>prasinus</i> .
5. 6.	Orange, <i>aurantius</i> ,	Flame-col. <i>flammeus</i> .	Tawny, <i>fulvus</i> ,	Carnation, <i>gilvus</i> (s. <i>incarnatus</i> , s. <i>carneus</i>).
1. 2.	Ash-col. <i>cinereus</i> ,	Hoary, <i>incanus</i> ,	Lead-col. <i>plumbeus</i> ,	Livid, <i>lividus</i> .
2. 3. 5.	Brown, <i>fuscus</i> ,	Bright bay, <i>spadiceus</i> ,	Full bay, <i>badius</i> ,	Ochrey, <i>ochraceus</i> .

Obs. Compound words are to be employed for expressing the intermediate colours.—The above account of Colours, which is taken from Forster's *Enchiridion*, considered optically, is incorrect. The primary colours are seven, namely, red, orange, yellow, green, blue, indigo, and violet. In the *Delineatio Plantarum*, as given in the *Systema Vegetabilium* by Linnæus, the following colours only are enumerated, viz.

Water-coloured, *hyalinus*.

Red, *ruber*.

Purple, *purpureus*.

White, *albus*.

Gloomy, *tristis*.

Black, *niger*.

Yellow, *luteus*.

Green, *viridis*.

Ash-coloured, *cinereus*.

Tile-coloured, *testaceus*.

D. 1339. TOUCH, *tactus*, affecting the nervous fibrils of the skin.

1340. Moist, *humidus*.

1341. Parched, or Dry, *aridus*.

1342. Tomentous, *tomentosus*.

1343. Lucid, *lucidus*.

1344. Juicy, *succosus*.

1345. Scariose, *scariosus*.

1346. Fleshy, *carnosus*.

1347. Membranous, *membranaceus*.

1348. Viscid, *viscidus*.

1349. Rough, *scaber*.

E. MEASURE, *mensura*.

1350. A Line, *linearis* s. *linea*, as long as the crescent at the root of the finger nail (not the thumb)—One twelfth of an inch.

1351. A Nail, *unguicularis* s. *unguis*, as long as the nail—About half an inch.

1352. An Inch, *pollicaris*, s. *pollex*, as long as the last joint of the thumb.

1353. A Hand, *palmaris*, s. *palma*, equal to the breadth of four fingers—About three inches.

1354. A Span, *spithamæa*, s. *spithama*, as long as the space between the points of the thumb and fore finger, when extended—About six inches.

1355. A Long Span, *dodrantalis*, s. *dodrans*, the space between the points of the thumb and little finger, when extended—About nine inches.
1356. A Foot, *pedalis*, s. *pes*, as long as from the bend of the elbow to the base of the thumb—Twelve inches.
1357. A Cubit, *cubitalis*, s. *cubitus*, as long as from the bend of the elbow to the middle of the finger.—About eighteen inches.
1358. A Fathom, *orgyalis*, s. *orgya*, the height of a man, or the distance between the points of the fingers, when the arms are extended—About six feet.

VII. USE.

- A. 1359. NATURAL, *naturalis*, to which it is applied in the general Economy and Polity of Nature.
- a. 1360. Economy and Polity of Nature, *œconomia natura, ejusque politia*.
—— Sympathy, *sympathia*. Antipathy, *antipathia*.
- b. 1361. Pan, *Pan*, food of the domestic herbivorous animals.
- c. 1362. Pandora, *Pandora*, food of insects.
- B. 1363. ARTIFICIAL, *artificialis*, to which it is applied by man.
- a. 1364. CULINARY, *culinaris*: Roots, Potherbs, Fruits.
- b. 1365. OFFICINAL, *officinalis*:
a. Simple, *simplicia*. Prepared, *præparata*.
b. Price, *pretium*. Place, *locus*.
- c. 1366. MEDICAL, *medicus*: Powers, *vires*. Use, *usus*.
- d. 1367. ECONOMICAL, *œconomicus*.
a. Instrumental, *instrumentalis*, for the Mechanic.
b. Pastoral, *pastoralis*, for the Shepherd.
c. For Dyeing, *tinctorius*.
d. For Culture, *culturæ*.
1. Grain, *cerealia*.
2. Market, *macellum*.
3. Shop, *officinalis*.
4. Nursery, *arboretum*. Shrubbery, *frutetum*.
5. Orchard, *Pomona*.
6. Pastures, *pascua*.

KEY OF THE SEXUAL SYSTEM.

NUPTIALS OF PLANTS.

Act of generation of the inhabitants of the Vegetable Kingdom.

Florescence.

PUBLICK.

Nuptials openly celebrated.

Flowers visible to every one.

MONOCLINIA, One Bed.

Husbands and Wives have the same bed.

All the flowers hermaphrodite; stamens and pistils in the same flowers.

NO AFFINITY.

Husbands not related.

Stamens not cohering with each other in any one part.

INDIFFERENCE, Equality.

Husbands of equal rank.

Stamens of an indeterminate length.

1. MONANDRIA.

2. DIANDRIA.

3. TRIANDRIA.

4. TETRANDRIA.

5. PENTANDRIA.

6. HEXANDRIA.

7. HEPTANDRIA.

8. OCTANDRIA.

9. ENNEANDRIA.

10. DECANDRIA.

11. DODECANDRIA.

12. ICOSANDRIA.

13. POLYANDRIA.

SUBORDINATION.

Certain Husbands preferred to the others.

Two Stamens constantly shorter than the rest.

14. DIDYNAMIA.

15. TETRADYNAMIA.

AFFINITY.

Husbands related.

Stamens cohering with each other, or with the pistil.

16. MONADELPHIA.

17. DIADELPHIA.

18. POLYADELPHIA.

19. SYNGENESIA.

20. GYNANDRIA.

DICLINIA, Two Beds.

Husbands and Wives have distinct beds.

Male and Female Flowers in the same species.

21. MONOECIA.

22. DIOECIA.

23. POLYGAMIA.

CLANDESTINE.

Nuptials secretly performed.

Flowers scarcely discernible by the naked eye.

24. CRYPTOGAMIA.

CHARACTERS OF THE CLASSES.

- | | | | | |
|---|--|-------------|-----|--|
| 1. | MONANDRIA. Pl. IX. f. 1. | Stamens | 1. | |
| 2. | DIANDRIA. ——— f. 2. | ———— | 2. | |
| 3. | TRIANDRIA. ——— f. 3. | ———— | 3. | |
| 4. | TETRANDRIA. ——— f. 4. | ———— | 4. | |
| <p style="margin-left: 40px;">(Obs. If the two nearest stamens be shorter, the plant must be referred to Class 14.)</p> | | | | |
| 5. | PENTANDRIA. Pl IX. f. 5. | ———— | 5. | in the same flower with the pistil, or pistils, equal in length (or of an indeterminate length); and neither cohering with each other, nor inserted in the pistil. |
| <p style="margin-left: 40px;">(Obs. If the anthers be connected, the plant belongs to Class 19.)</p> | | | | |
| 6. | HEXANDRIA. ——— f. 6. | ———— | 6. | |
| <p style="margin-left: 40px;">(Obs. If the two opposite stamens be shorter, the plant is to be referred to Class 15.)</p> | | | | |
| 7. | HEPTANDRIA. ——— f. 7. | ———— | 7. | |
| 8. | OCTANDRIA. ——— f. 8. | ———— | 8. | |
| 9. | ENNEANDRIA. ——— f. 9. | ———— | 9. | |
| 10. | DECANDRIA. ——— f. 10. | ———— | 10. | |
| 11. | DODECANDRIA. ——— f. 11. | 12 to 19. | 19. | |
| 12. | ICOSANDRIA. ——— f. 12. | about 20. | 20. | |
| <p style="margin-left: 40px;">(Obs. The stamens, commonly twenty or more, are inserted in the inside of the calyx, not in the receptacle.)</p> | | | | |
| 13. | POLYANDRIA. ——— f. 13. | 20 to 1000. | 13. | |
| <p style="margin-left: 40px;">(Obs. The stamens are inserted in the receptacle.)</p> | | | | |
| 14. | DIDYNAMIA. Stamens four in the same flower with the pistil, the two nearest shorter. Pl. IX. f. 14. | | | |
| 15. | TETRADYNAMIA. Stamens six in the same flower with the pistil, the two opposite ones constantly shorter. Pl. IX. f. 15. | | | |
| 16. | MONADELPHIA. The stamens united at the base by their filaments into one body or set, in the same flower with the pistil. Pl IX. f. 16. | | | |
| 17. | DIADELPHIA. The stamens united by their filaments into two sets, in the same flower with the pistil. Pl. IX. f. 17. | | | |
| <p style="margin-left: 40px;">Obs. Several genera, referred to this class, properly belong to Monadelphia, the stamens being united by their filaments so as to form only one set</p> | | | | |

or brotherhood. Linnæus has chosen in this instance to transgress against the principles of his own system, rather than separate the plants with *papilionaceous* flowers, which form a Natural Order.

18. **POLYADELPHIA.** The stamens united by their filaments into three or more sets, in the same flower with the pistil. Pl. IX. f. 18.

19. **SYNGENESIA.** The stamens united by their anthers in a cylindrical form, in the same flower with the pistil. Pl. IX. f. 19.

20. **GYNANDRIA.** The stamens inserted in the pistils (not in the receptacle). Pl. IX. f. 20.

21. **MONOECIA.** Male and Female Flowers on the same plant. The stamens and pistils in distinct flowers, on the same plant. Pl. IX. f. 21.

22. **DIOECIA.** Male and Female Flowers on different plants of the same species. Pl. IX. f. 22.

23. **POLYGAMIA.** Hermaphrodite and Male, Hermaphrodite and Female, or Hermaphrodite Male and Female Flowers on the same plant, or on two or three distinct plants of the same species. Pl. IX. f. 23.

24. **CRYPTOGAMIA.** Flowers concealed within the fruit, or in some particular manner. (The stamens and pistils so minute that they can scarcely ever be discerned by the naked eye: Hence these plants do not easily admit of being arranged according to the essential parts of fructification.) Pl. IX. f. 24. A. B. C. D.

PALMÆ. Stem simple, *frondose* at the top; fructifications upon a *Spadix* with a *Spathe*.

Obs. The *Palmae* have been always kept distinct, as an Appendix to the system, but might very properly be incorporated with the other Classes; for example, *Corypha*, &c. are hermaphrodite, hexandrous and might therefore be referred to the 6th Class; *Areca*, &c. might be referred to Monoecia; *Zamia*, &c. to Dioecia; and *Chamarops* to Polygamia.

CHARACTERS OF THE ORDERS.

Obs. The Orders are taken from different circumstances,

- viz.*
1. From the number of Pistils. e. g. *Monogynia*, &c.
 2. From the absence of a Pericarp. e. g. *Gymnospermia*.
 3. From the presence, or nature of the Pericarp. e. g. *Angiospermia*, *Siliculosa*, *Siliquosa*.
 4. From the number, connection, and insertion of the Stamens. e. g. *Monandria*, *Monadelphia*, *Syngenesia*, *Gynandria*.
 5. From the disposition, and nature of the Florets. e. g. *Polygamia* *Æqualis*, *Polygamia* *Superflua*, &c.
 6. From the number of houses inhabited by plants of the same species. e. g. *Monoecia*, *Dioecia*, *Trioecia*.
 7. From the structure of the Vegetables in the class *Cryptogamia*, as well as from the fructifications. e. g. *Filices*, &c.

In the first thirteen classes *Monandria*—*Polyandria*, the Orders derive their names from the *Number* of Pistils, which is to be taken from the base of the Style if present, and, if the style be wanting, from the number of the Stigmas.

We have ten Orders of this kind.

1. <i>Monogynia</i> containing the plants with ..	1.	} pistils in a hermaphrodite flower.
2. <i>Digynia</i>	2.	
3. <i>Trigynia</i>	3.	
4. <i>Tetragynia</i>	4.	
5. <i>Pentagynia</i>	5.	
6. <i>Hexagynia</i>	6.	
7. <i>Heptagynia</i>	7.	
8. <i>Decagynia</i>	10.	
9. <i>Dodecagynia</i>	12.	
10. <i>Polygynia</i>	many	

Obs. Some of these Orders only occur in one Class.

In the 14th Class (*Didynamia*) the Orders are only two, *viz.*

1. *Gymnospermia*, which comprehends those plants that have *naked seeds* in the bottom of the calyx.
2. *Angiospermia*, comprehending those plants which have their seeds enclosed in a pericarp.

The Orders in the 15th Class (*Tetradynamia*) are likewise two, and are taken from the figure of the pericarp, *viz.*

1. *Siliculosa*, containing those plants, which have their Seeds in a Silicle. See Page 38.
2. *Siliquosa*, containing those, which have their Seeds in a Siliqua. See Page 38.

In the 16, 17, and 18th Classes (*Monadelphia*, *Diadelphia*, and *Polyadelphia*) the Orders are taken from the Number of Stamens.

We have ten Orders of this kind, viz.

1. <i>Triandria</i> , comprehending plants with ..	3.	} stamens.
2. <i>Pentandria</i>	5.	
3. <i>Hexandria</i>	6.	
4. <i>Octandria</i>	8.	
5. <i>Enneandria</i>	9.	
6. <i>Decandria</i>	10.	
7. <i>Endecandria</i>	11.	
8. <i>Dodecandria</i>	12.	
9. <i>Icosandria</i> (the stamens inserted in the calyx)	20.	
10. <i>Polyandria</i> (the stamens standing on the receptacle)	many.	

In the 19th Class (*Syngenesia*) the Orders are six, and are taken from the disposition, and nature of the florets, viz.

1. *Polygamia Æqualis*, all the florets hermaphrodite.

Obs. The four following orders (*P. Superflua*, *Frustranea*, *Necessaria*, and *Segregata*) are comprehended by the Term *Polygamia Spuria*, by which it is understood, that Hermaphrodite Florets occupy the disk, or centre, and are surrounded by female or neuter florets.

The plants, referred to these four orders, properly belong to the Class *Polygamia*, for Linnæus has violated the principles of his own System that he might not separate plants belonging to the same Natural Order.

2. ——— *Superflua*, the florets of the disk (or centre) hermaphrodite, the florets of the ray (or circumference) female, and both producing fertile seeds.
3. ——— *Frustranea*, the florets of the disk hermaphrodite, and producing seeds; the florets of the ray without stigmas, and consequently barren.
4. ——— *Necessaria*, the florets of the disk hermaphrodite, but barren from want of stigmas; the florets of the ray female, and producing perfect seeds.
5. ——— *Segregata*, several partial flower-bearing calyxes, comprehended by a common calyx, so as to form only one flower.
6. *Monogamia*, a single hermaphrodite syngenesious flower (i. e.) a single flower with the anthers united.

Obs. The plants, comprehended by this Order, have been referred by some botanists to the Class *Pentandria*, and Linnæus would not have violated more the principles of his system by removing them to the 5th Class (by which means the Class *Syngenesia* would have been rendered perfectly natural), than by retaining the Orders *Polygamia*, *Superflua*, *Frustranea*, *Necessaria*, and *Segregata* in the 19th Class.

In the 20th Class (*Gynandria*) the Orders are nine, and are taken from the number of the stamens, viz.

1. <i>Diandria</i> .	} comprehending plants with	2.	} stamens.
2. <i>Triandria</i> .		3.	
3. <i>Tetrandria</i> .		4.	
4. <i>Pentandria</i> .		5.	
5. <i>Hexandria</i> .		6.	
6. <i>Octandria</i> .		8.	
7. <i>Decandria</i> .		10.	
8. <i>Dodecandria</i> .		12.	
9. <i>Polyandria</i> .		many	

In the 21st and 22d Classes (*Monoecia* and *Dioecia*), besides the twelve Orders, which are taken and named from the number of the stamens, viz. *Monandria*, *Diandria*, *Triandria*, *Tetrandria*, *Pentandria*, *Hexandria*, *Heptandria*, *Octandria*, *Enneandria*, *Decandria*, *Dodecandria*, *Polyandria*, we have the following three, taken from the connection, and insertion of the stamens.

13. *Monadelphia*, all the stamens united by their filaments into one set.
14. *Syngenesia*, all the stamens united by their anthers.
15. *Gynandria*, all the stamens inserted in the pistils.

In the 23d Class (*Polygamia*), the three Orders derive their names from the number of houses occupied by the plants of one species, and are

1. *Monoecia*, hermaphrodite and male, or hermaphrodite and female flowers occupying only one house, (i. e.) being found on one individual plant.
2. *Dioecia*, hermaphrodite and male, or hermaphrodite and female flowers occupying two houses, (i. e.) not found on the same individual).
3. *Trioecia*, hermaphrodite, male, and female flowers occurring on three distinct plants of the same species.

Obs. The different Orders are illustrated by a figure of one genus, belonging to each, in Volume second.

In the 24th Class (*Cryptogamia*) are the four following Orders.

1. *Filices*, plants bearing their fructifications on the back, or

margin of the leaf (disposed in dots, lines, &c.; or in spikes; or at, or near the root). Pl. IX. f. 24. A.

2. *Musci*, having an anther without a filament, distant from the female flower, which is destitute of a pistil, *Seeds* wanting both a proper coat, and cotyledons. (Plants having *Capsules* envelopped in a *Calyptre*; leaves membranous, reticulated; when dried, reviving by being moistened). Pl. IX. f. 24. B.

3. *Algæ*, having the root, leaves, and stem all in one. Pl. IX. fig. 24. C.

Obs. According to this definition, *Jungermannia* is improperly placed amongst the *Algæ*.

4. *Fungi*, having the fructifications disposed betwixt plates (gills), in tubes, &c; mostly of a fleshy, or cork-like consistence, and generally of short duration. Pl. IX. f. 24. D.

TERMS AND DEFINITIONS

used by

HEDWIG,

in his

CHARACTERS AND DESCRIPTIONS

of the

FRONDOSE MOSSES,

given in the

*Fundamentum Histor. Nat. Musc. & Descriptio & Adumbratio
Microscopico-Analytica Muscorum, &c.*

MOSSES, *musci*, plants furnished with a calyptré.

The MOSSES are divided into two Orders by Hedwig, viz.

1. FRONDOSE, *frondosi*, plants furnished with a calyptrate style-bearing petal, bursting at the base, and elevated by the capsule; the capsule lidded.
2. Hepatic, *hepatici*, plants furnished with a calyptrate style-bearing petal, bursting at the summit, the capsule four-valved; e. g. *Fungermannia*.

DESCRIPTION of the FRONDOSE MOSSES.

I. ROOT, *radix*. Page 1.

- a. Primordial, or Principal, *primordialis* s. *primicera*,
Secondary, or Succedaneous, *secundaria* s. *succedanea*.
- b. Basilar, *basilaris*, at the base of the stem.
Axillary, *axillaris* s. *alaris*, from the axils of the leaves.
Interfoliar, *interfoliaris*, arising between the leaves.
- c. Perpendicular, *perpendicularis*.
Creeping, *repens*, &c. (8).

- d. Simple, *simplex*.
Divided, or Branched, *divisa* s. *ramosa*.
Radiculose, *radiculosa*, sending off radicles.
Branched-fibrous, *ramoso-fibrosa*.
- e. Long, *longa*. Short, *brevis*.
- f. Whitish, *albicans*. Blackish, *nigricans*.
Brown, *fusca*.

II. TRUNK or STEM, *truncus* s. *caulis*.

Obs. Very few of the mosses are stemless, many, which are supposed to be so, having really stems of a small size, covered with leaves.

- a. Primary, or Primordial, *primarius* s. *primordialis*.
Succedaneous, *succedaneus*.
- b. Annual, *annuus*. Biennial, *biennis*.
Triennial, *triennis*. Perennial, *perennis*.
- c. Simple, *simplex*. Branched, *ramosus*, &c.
- d. Leafless, *aphyllus*. Leafy, *foliatus* s. *foliosus*.

Obs. There is only one species, hitherto known, which is leafless, namely, *Buxbaumia aphylla* SCHMID.

- e. Filiform, *filiformi*.
Slender, *exilis* s. *tenuis*.
Weak, *debilis*. Rigid, *rigidus*.
Firm, *firmus*, &c.
- f. Two, Three, Four, &c. Lines long, *bi-tri, quadrilina-*
ris, &c.
Half an Inch, *semuncialis*.
An Inch, *uncialis* s. *pollicaris*, &c. &c.
- g. Green, *viridis*. Brown, *fuscus*, &c.
- h. Erect, *erectus*. Incurved, *incurvatus*.
Creeping, *repens* (43). Procumbent, *procumbens*, (40). &c.

BRANCHES, *rami*.

- a. Simple, *simplices*. Divided, *divisi*.
Subdivided, *subdivisi*.
- b. Erect, *erecti*, inserted at an acute angle, &c.
- c. Flower-bearing, *floriferi*, &c.

III. LEAVES, *folia*.

- a. Radical, or Root-, *radicalia*, (110).
- b. Cauline, or Stem-, *caulina*, (111).
Rameous, or Branch-, *ramea*, (112).
- b. Sessile, *sessilia*, (150).
Stem-clasping, *amplexicaulia*, (154).

Decurrent, *decurrentia*, (153).

Obs. The Leaves of Mosses are never petioled.

- c. Alternate, *alterna*, (115). Imbricated, *imbricata*, (120). &c.
One-rowed, *secunda* s. *heteromalla*, (526).
- d. Erect, *erecta*, (101). Incurved, *incurvata*, (37). &c.
- e. Flat, *plana*, (246). Concave, *concava*, (248).
Furrowed, *sulcata*, (226). Striated, *striata*, (225).
- f. Ovate, *ovata*, (160). Oblong, *oblonga*, (162).
Linear, *linearia*, (169). Subulate, *subulata*, (269).
Lanceolate, *lanceolata*, (167, &c. &c.
- g. Acute, *acuta*, (209). Obtuse, *obtusa*, (204).
Hair-pointed, *piligera*, bearing a hair at the apex.
Tendrilled, *cirrhusa*, &c. &c.
- h. Very entire, *integerrima*, (193). Crenate, *crenata*, (194).
Toothed, *dentata*, (197). Serrated, *serrata*, (195).
Undulated, *undulata*, (252), &c. &c.
- i. Membranous, *membranacea*, (254).
Fleshy, *carnosa*, (264). Rigid, *rigida*, (131).
- k. Reticulated, *reticulata*, (938).
Hooked, *hamosa*, furnished with hooks, (367).
Thorny, *spinosa*, &c. &c.
- l. Persisting, *persistentia*, &c.
- m. Glaucous, *glaucia* s. *glaucescencia*, &c.

IV. FRUCTIFICATION.

A. FLOWERS, *flores*.

a. SEX.

Male, *masculi*, (1197). Pl. X. f. 1.

Female, *feminini*, (1198). Pl. X. f. 2.

Hermaphrodite, or Androgynous, *hermaphroditi* s. *androgyni*, (1199). Pl. X. f. 17.

Obs. Instances of a true hermaphrodite flower occur only in very few instances, e. g. *Bryum pomiforme*, *trichodes*, & *subulatum*. Hall.

b. DISPOSITION.

Monoicous, *monoici*, males and females on the same plant.

Dioicous, *dioici*, males and females on distinct individuals.

Polygamous, *polygami*, hermaphrodites and males or females in the same species.

Obs. Examples of polygamy have been observed by Hedwig in *Mnium palustre*, *annotinum*, and another new species of this genus. In *Bryum trichodes* (*Meesia uliginosa* Hedw.) male female, and hermaphrodite flowers are found on different plants. *Phascum* and some

of the *Bryums* are monoicous ; but the greatest number of Mosses are dioicous.

c. FORM.

Obs. The external form of the flowers is carefully to be attended to, especially in the males, since the diversity of this affords, if not the primary, at least the secondary grounds, upon which the mosses are distributed into genera.

Club-shaped, *clavæformes* s. *clavati*, from the disposition of the leaflets these might be named imbricated, (*imbricati*), as in *Sphagnum palustre*. Lin.

Capituliform, *capituliformes*, terminating, the diameter of the aperture much smaller than that of the middle of the flower, as in *Mnium pellucidum* and *Bryum viridulum*, &c. Lin. Pl. X. f. 22.

Gemmaceous, or Bud-like, *gemmaformes* s. *gemmaei*, axillary, the aperture very small, as in *Hypnum taxifolium*, &c. Pl. X. f. 20.

Stellate, Discoid, or Disk-like, *stellati*, *disciformes* s. *discoidei*, spreading so much, that the diameter of the border is equal to, or greater than, that of the middle of the flower, as in *Polytrichum commune*, &c. Lin.

Elongated, or Oblong, *elongati* s. *oblongi*, as in *Splachnum mnioides*, *Phascum mnioides*. Lin.

Dimorphous, *dimorphi*, of two different forms, as discoid, and elongated.

d. SITUATION.

Terminating, *terminales*, (385). Lateral, *laterales*, (320).

Basilar, *basilares*, at the base of the stem.

Cauline or Stem-, *caulini*, (111). Sessile, *sessiles*, (150).

Rameous, or Branch-, *ramei*, (112).

Axillary, *axillares* s. *alares*, (113).

Obs. In *Hypnum taxifolium* the females are basilar, the males cauline and axillary ; in *Hypnum triquetrum*, *parietinum*, &c. the males are rameous, and the females cauline ; in *Sphagnum palustre* the males are found in the thickened extremities of the upper branches, and the females are axillary.

e. NUMBER.

Solitary, *solitarius*, &c.

f. TIME.

Spring, Summer, &c. June, July, &c.

B. PARTS of FRUCTIFICATION.

a. PERICHÆTIUM, or PERICONIUM, *perichætium* s. *perigo-*

68 HEDWIG'S TERMS, &c. MOSSES. Perigonium.

nium, the leaflets defending the male and female organs.
Pl. X. f. 20. f. 1. a. c.

Obs. It is analogous to, or a species of calyx, and consists of scales or leaflets, differing in size and form from the other leaves of the plant. It is found surrounding male, female, and hermaphrodite flowers; and the form of the flowers depends on the figure, arrangement and direction of the parts composing the perichætium or perigonium.

Imbricated, *imbricatum*, (61).

Persisting, *persistens*, (274).

Obs. The perigonium both of males and females exceed very much in duration the function of the flowers. *Hypnum parietinum* retains male flowers even three years, which are of an elegant purple colour; whilst the perichætium of those which are recent, is of a dilute green.

Four—Ten—Twelve-leaved, *tetra*, *deca*, *dodecaphyllum*.

LEAFLETS of the Perigonium.

a. External, *externa* s. *extima*.

Intermediate, *intermedia*.

Internal, *interna* s. *intima*. See Dictionary.

b. Six—Ten—Numerous, *senā—decem—numerosa*.

c. Ovate, *ovata*. Lanceolate, *lanceolata*, &c.

d. Acuminate, *acuminata*. Mucronate, *mucronata*, &c.

e. Ciliate, *ciliata*.

b. CALYPTRE, *calyptra*, the inner covering, or corol of the female organ. Pl. IX. f. 24. B. a. Pl. X. f. 3. e.

Obs. This is considered as the calyx by Linnæus. See (620). The male flowers are destitute of a calypstre. The female flowers of the Musci are all calyptrate; the calypstre is cowled, or mitre-form (*cuculliformis* s. *mitriformis*), closed at the top, covering the ovary but not the style, often remaining till maturity. When the ovary becomes enlarged, and the peduncle (or fruit-stalk) elongated, the calypstre is torn, all round at the base from the receptacle, and carried up by the capsule.

a. Even, *lævis*, (65). Striated, *striata*, (66).

Hairy, *pilosa*, (241). Villous, *villosa*, (72).

b. Campanulate, *campanulata*, as in *Splachnum ampullaceum*.
Narrow, *angusta*, &c.

c. Cloven laterally, *lateraliter fissa*.

d. Pale, *pallida*. Brown, *fusca*, &c. &c.

c. STAMEN, *stamen* s. *genital: masculum*. Pl. X. f. 1. a.

a. Number.

Few, *pauca*. Numerous, *numerosa*.

Six—Eight—Twelve, *sex—octo—duodecim*.

b. Parts.

1. FILAMENT, *filamentum*, the part supporting the anther or male organ. Pl. X. f. 5. a.

Short, *breve*. Very short, *brevissimum*.

2. ANTHER, or FOLLICLE, *anthera* s. *folliculus*. Pl. X. f. 5. b.

a. Cylindrical, *cylindrica*. Globular, *globosa*.

Oval, *ovalis*. Cordate, *cordata*.

β. Whitish, *albicans*. Greenish, *dilute viridis*.

Obs. The anther or follicle is always observed to burst at the top, and to discharge its pollen at that aperture. Pl. X. f. 4.

PARAPHYSES, *paraphyses* s. *fila succulenta*, succulent bodies accompanying the stamens and pistils, which have a jointed appearance owing to transverse partitions. Pl. X. f. 1. b.

- a. Filiform, *filiformes*, (441). Club-shaped, *clavata*, (292). Dilated into globules, *in globulos dilatata*. Pl. X. f. 4.

b. Short, *breves*. Long, *longa*.

c. None, *nulla*. Few, *paucæ*.

Two—Four—Numerous, *duæ—quatuor—numerosæ*.

- d. PISTIL, *pistillum* s. *genitale femineum*. Pl. X. f. 2. a. b. c.

a. Number

Three—Six—Eight—Twelve, *tria*, &c.

b. Parts.

1. OVARY, *ovarium*, the germen or rudiment of the fruit. Pl. X. f. 2. a.

Obs. The Ovary is of an oblong globular form, and of a green colour.

2. STYLE, *stylus*, *tubus* s. *meatus deferens*, Pl. X. f. 2. b.

a. Deciduous, *deciduus*, soon falling off after impregnation. Persisting, *persistens*, remaining a long time.

b. Cylindrical, *cylindricus*, &c.

3. STIGMA, *stigma*. Pl. X. f. 2. c.

a. Villous, *villosum*, beset with soft hairs.

Warty, *verrucosum*, beset with a kind of warts.

b. Laciniated, *lacinosum*, (191).

Trumpet-form, *tubæforme*.

Vesicular, *vesiculosum*.

ADDUCTORS, *adductores* s. *opitulatores*, bodies accompanying the pistil, and resembling it in form, structure, &c. Pl. X. f. 2. d.

Obs. These bodies are from two to twelve, and are sometimes altogether wanting: They are ascertained by Hedwig to be barren pistils.

e. PEDUNCLE, *pedunculus* s. *setula*, the fruit-stalk, or part elevating the capsule. Pl. X. f. 3. b.

Obs. Although there is not any appearance of the peduncle in the flowers of Mosses, yet there must be a point, by means of which the ovary coheres with the receptacle; and this is afterwards generally so much elongated as to elevate the capsule to a considerable height, and then takes the name of peduncle. The peduncle is never absolutely wanting, although in some species, as *Phascum serratum*, it is so very short, that the capsules are considered as sessile.

- a. Short, *brevis*. Long, *longus*. &c.
- Half an Inch, *semuncialis*, &c. See Page 65.
- b. Straight, *rectus*. Incurved, *incurvatus*.
- Perpendicular, *perpendicularis*.
- Twisted, *tortilis*, &c. &c.

Obs. The peduncle, though perpendicular at first, often becomes curved at the top, when the capsule approaches to maturity: And in one instance from being incurved, it becomes straight, viz. in *Bryum pulvinatum*.

- c. Slender, *tenuis*. &c. &c.
- d. Even *lævis*. Rough, *exasperatus*.
- Muriculate, *muriculatus*.
- e. Reddish, *rubicundus*.
- Blood-coloured, *sanguineus*, &c. &c.
- f. Sheathed, *vaginatus*.

SHEATH, *vaginula*, the part which receives the base of the peduncle and connects it with the plant. Pl. X. f. 3. a.

- a. None, *nulla*, the sheath is wanting only in *Sphagnum palustre*.
- b. Long, *longa*. Short, *brevis*. Minute, *minuta*.
- c. Oblong, *oblonga*. Cylindrical, *cylindrica*.
- Ovate, *ovata*. Conical, *conica*.
- Globular, *globosa*. Urceolate, *urceolata*.
- Inversely Pyriform, *inverse pyriformis*, &c.
- d. Straight, *recta*. Curved, *curvata*.
- f. CAPSULE, *capsula*, the pericarp. It is named *Anther* by Linnæus. Pl. X. f. 3. c.

Obs. The Capsule consists of the following parts, viz. *Apophysis*, *Case*, *Lid*, *Ring*, *Column* and *Peristome*.

- 1. APOPHYSIS, *apophysis*, or receptacle, a protuberance at the base of the capsule, where it is connected with the peduncle. Pl. X. f. 8. b.

Obs. The apophysis is wanting, or at least so small as not to be discerned, in many species, till the lid falls, and the capsule shrinks, all which species are said to be destitute of an apophysis.

a. Large, *magna*, larger than the capsule, as in *Splachnum ampullaceum*. Pl. X. f. 8. b.

Small, *parva*, smaller than the capsule as in *Polytrichum commune*.

b. Obovate, or Obcordate, *obovata* s. *obcordata*.

Spherical, *sphærica*, as in *Splachnum sphæricum*.

Somewhat Globular, *subglobosa*, as in *Splachnum vasculosum*.

Umbrella-shaped, *umbraculiformis*, as in *Splachnum rubrum* and *luteum*.

Quadrangular, *quadrangula*, as in *Polytr. commune*.

2. CASE, *theca* s. *vasculum seminale*, the lower part of the capsule containing the seeds. Pl. X. f. 6.

a. Direction.

Obs. To ascertain this circumstance, the case is to be examined in its most perfect state, either when the lid is going to fall off, or when it has just fallen off, and before the case is become empty or dried. When the natural form and situation are lost in consequence of the plant being dried, they may be regained by moistening it very well with water.

Erect, *erecta*, when a line, continued through the centre of the aperture of the case from the insertion of the peduncle, passes straight upwards.

Inclined, *inclinata*; when the line inclines at an acute angle, as in *Polytrichum urnigerum*.

Nodding, *nutans*, when the line goes off at a right angle, as in *Polytrichum commune*.

Pendulous, *pendula*, when the mouth of the capsule looks towards the ground, as in *Hypnum curtipendulum*, *Bryum argenteum*, &c.

Incurved, *incurva*, when the line proceeds in a crooked way, and is simply turned to one side, as in *Bryum scoparium*, and *undulatum*.

Recurved, *recurva*, when it proceeds in a crooked way, is reversed, and afterwards directed upwards, as in *Buxbaumia aphylla* and *sessilis*.

b. Form, &c.

Globular, *globosa*, when the longitudinal and transverse diameters are equal, as in *Sphagnum palustre*.

Ovate, *ovata*, when the longitudinal diameter is $\frac{1}{3}$ greater

than the transverse as in *Hypnum crispum*, *Bryum argenteum*.

Cylindrical, *cylindrica*, the transverse diameter shorter than the longitudinal, and equal at both extremities (every where), as in *Splachnum ampullaceum*, &c.

Conical, *conica*, when the diameter of the upper extremity is less than that of the lower, as in *Mnium pellucidum*, *Hypnum dendroides*.

Obconical, *obconica*, the reverse of *conical*.

Pyriform, *pyriformis*, when the diameter of the upper extremity is much larger than that of the lower, as in *Bryum pyriforme*, *cespitiolum*, &c.

Round, *teres*, cylindrical, and a transverse section every where perfectly circular.

Compressed, *compressa*, the two opposite sides further distant from the centre than the fore and back part as in *Buxbaumia*.

Angular, *angulata*, when the sides are plane, as in *Polypodium commune*.

Cernuous, *cernua*, when one surface consists of a wider, the other of a more contracted arch or bow, as *Mnium fontanum*, &c.

Obs. From the above terms others of a compound nature are formed, viz. erecto-cernuous *erecto-cernua*, pyriform-cernuous, *pyriformi-cernua*, nodding-cernuous, *nutans-cernua*. &c.

c. Colour.

Greenish, *virescens*. Green, *viridis*.

Brownish, *fuscescens*. Brown, *fusca*.

Red, *rubra*. Yellow, *luteola*, &c. &c.

Obs. *Mnium purpureum*, *palustre*, &c. have a furrowed capsule; but as this happens from the escape of some part of the seed, and the capsule drying and shrinking, it scarcely ought to be taken notice of.

3. Lid, *operculum*, the part covering the capsule. Pl. X. fig. 12. a.

Obs. 1. In the genus *Phascum*, the lid is wanting, there being only a rudiment of a lid, which does not fall off. Pl. X. f. 3. d.; the seeds are therefore either discharged through the bottom where the peduncle was attached, or escape through the sides.

Obs. 2. The lid ought to be examined when ready to fall off, as at this time it is generally deprived of its Calyptra, and is in a middle state between the greatest dryness and succulency.

a. Form.

Convex, *convexum*, when it is a perfect hemisphere, as in *Mnium hygrometricum*, and *Bryum apocarpum*, &c.

Conical *conicum*, when the sides are straight, and form a more or less acute triangle, as in *Fontinalis antipyretica*, &c.

Pyramidal, *pyramidatum*, when the sides are more than $\frac{2}{3}$ longer than the base, and the superior angle is very acute, as in *Bryum murale, rurale*, &c.

Acuminate, *acuminatum*, when the convexity is somewhat greater than a hemisphere, and suddenly comes to a point, as in *Hypnum riparium, palustre*, &c.

Fastigate, *fastigiatum*, when the convexity is more than hemispherical, and being surrounded by a depression, is from thence gradually narrowed, as in *Mnium purpureum*.

Mucronate, *mucronatum*, when the projecting part placed upon the convexity is very narrow and shorter, as in *Bryum apocarpum*, a. Lin.

Obs. The Point, *mucro*, is recurved, *recurvus*, as in *Polytrichum urnigerum*; incurved, *incurvus*; as in *Bryum truncatulum*, straight and truncated, *rectus truncatus*, as in *Bryum pyriforme*.

Beaked, or Rostrate, *rostratum*, when the projecting portion is further extended in length, as in *Bryum unguiculatum, heteromallum*, &c.

Obs. The Beak, *rostrum*, is recurved, *recurvum*, incurved, *incurvum*, straight, *rectum*, as in *Bryum extingtorium*, &c.

b. Colour.

4. RING, *annulus*, a circular belt placed between the case and the lid. Pl. X. f. 12. b.

Obs. It consists of a firm coloured part, forming an evident joint, and of processes disposed in a double, treble, or quadruple series.

None, *nullus*.—It is frequently wanting.

Indistinct, *vix ullus*, very small.

Small, *exiguus*.

Very tender, *tenerrimus*.

Fringed, *fimbriatus*.

Red, *ruber*, &c. &c.

5. COLUMN, *columnula*, a central body, extending from the bottom of the case to the top of the lid. Pl. X. f. 18. b.

Obs. It differs very much in its form and dimensions.

6. PERISTOME, *peristomium* s. *peristoma*, the apparatus ob-

served at the mouth of the case, when the lid falls off.
Pl. X. f. 9. &c.

Obs. The Peristome was named *Corona* by Haller, who first intimated that the musci might be arranged according to this part.

None, *nullum*, the peristome is entirely wanting in *Phascum*, which has no lid that separates. Pl. X. f. 3.

Naked, *nudum*, not furnished with any eminencies or processes, as in *Sphagnum palustre*, &c. Pl. X. f. 6. and 18.

Figured, *figuratum* s. *effiguratum*, adorned with processes &c.

A. SINGLE, *simplex*, the processes in a single series, or proceeding from only one of the membranes of the case. Pl. X. f. 7, 9, 10, 11, 13.

a. Toothed, *dentatum*, formed from the external membrane only. Pl. X. f. 7. The Teeth are

a. Short, *breves*. long, *longi*. Small, *exigui*.

b. Entire, *integri*. Cloven, *fissi*.

Bifid, or Two-forked, *bifidi* s. *bifurci*.

Bicuspidate, *bicuspidati*.

Trifid, *trifidi*.

Divided to the base, *ad basin divisi*, &c.

c. Subulate, *subulati*. Capillary, *capillares*.

Cuneiform, *cuneiformes*. Triangular, *triangulares*.

Pyramidal, *pyramidati* s. *pyramidales*.

Narrow, *angusti*. Acuminate, *acuminati*.

Broadish, *latiusculi*. Truncated, *truncati*.

d. Incurved, *incurvati* s. *incurvi*. Straight, *recti*.

Becoming reflected, *reflexiles*.

e. Jointed, *articulati*.

Striated transversely, *transversim striati*.

f. Four, Eight, Sixteen, Thirty-two, *quatuor, octo, sedecim, triginta duo*.

In pairs, *geminati*.

g. Free, *liberi*, not connected.

Connected at the summits, *apicibus connexi*.

Connected at the base, *basi connexi*.

h. Converging into a cone, *in conum convergentes*.

i. Whitish, *albescentes*. Yellowish, *lutescentes*.

Reddish, *rubelli*. Purple, *purpurei*, &c. &c.

b. Ciliate, *ciliatum*, the processes, &c. proceeding from the internal membrane only of the case. Pl. X. f. 11.

The *Cilia* are

Simple, *simplicia*. Cloven, *fissa*.

Filamentous, *filamentosa*.

Two-bristled, *bista*, ending in two long bristles.

Twisted, *tortilia*. Incurved, *incurva*.
Spirally convolute, *spiraliter convoluta*.

B. DOUBLE, or COMPOUND, *duplex s. compositum*, the processes in a double series, and formed from both the outer and inner membranes. Pl. X. f. 14, 15.

a. External, *externum*, formed from the outer membrane.

a. Toothed, *dentatum*. Pl. X. f. 14, 15. a. a. See above.

b. Internal, *internum*, formed from the inner membrane.

a, Ciliate, *ciliatum*. Pl. X. f. 14. b. See above. The

CILIA are

Solitary, *solitaria*.

Two together, *bina s. gemina*, &c.

Tender, *tenera*. Very tender, *tenerrima*.

Shortish, *breviuscula*, &c.

b. Membranous, *membranaceum*. The Membrane is

Keeled, *carinata*. Furrowed *sulcata*.

Whitish, *albicans*. Yellowish, *lutescens*.

Toothed, *dentata*.

Crowned by Processes, *processibus coronata*. The

PROCESSES are

Slender, *graciles*.

Acuminate, *acuminati*.

Conical, *conici*.

Pyramidal, *pyramidati*.

Converging conically, *conice convergentes*.

Perforated, *perforati s. pertusi*.

Imperforated, *imperforati*.

United at the extremities, *extremitatibus conjugatis s. bijugis*.

As many as the teeth, *ad numerum dentium*.

Sixteen, &c. *sedecim*, &c.

c. Reticulated, *reticulatum*, like network. Pl. X. f. 15. b.

g. SEEDS.

a. Spherical, *sphaerica*. Oval, *ovalia*.

b. Even, *laevia*. Rugged *scruposa*.

Echinate, *echinata*, covered with prickles, as in *Bryum pyriforme*. Pl. X. f. 23. a.

Marked with circular depressions, *depressionibus circularibus notata*. Pl. X. f. 23. b.

Obs. From the diversity observable on the surface of the seeds of Mosses, it is evident that they have a proper coat or shell. And we are informed by Hedwig, that besides this, they possess cotyledons, and a corcle, or radicle and plumule. Pl. X. f. 24. a. b. c.

**A SYNOPTICAL TABLE of HEDWIG's Method, from
the Hist. Nat. Musc. Frondosorum. P. II. p. 83.**

CAPSULES.

I. PERISTOME NONE..... 1. PHASCUM.

II. PERISTOME NAKED: Male Flower

- | | |
|--------------------|----------------|
| 1. Clubshaped..... | 2. SPHAGNUM. |
| 2. Bud-like..... | 3. HEDWIGIA. |
| 3. Disk-like | 4. GYMNOSTOMA. |

III. PERISTOME FIGURED.

A. Simple.

a. Toothed.

a. Teeth entire.

- | | |
|---|------------------|
| 1. four: Male fl. dimorphous | 5. TETRAPHIS. |
| 2. eight: apophysis inflated;
Male flower disk-like.... | 6. SPLACHNUM, |
| 3. sixteen, narrow, erect:
Male flower bud-like.... | 7. LEERSIA. |
| 4. sixteen, broadish, becom-
ing reflected: Male flow-
er bud-like..... | 8. GRIMMIA. |
| 5. sixteen, broadish, reflect-
ed: Male flower capituli-
form | 9. WEISIA. |
| 6. thirty-two, holding a mem-
brane..... | 10. POLYTRICHUM, |

b. Teeth bifid

- | | |
|---|-------------------|
| 1. longer erect: Male flower
bud-like..... | 11. TRICHOSTOMUM. |
| 2. shorter inflected: Male fl.
* bud-like..... | 12. FISSIDENS. |
| * * capituliform..... | 13. DICRANUM. |

b. Ciliate twisted; Male flower

- | | |
|----------------------|--------------|
| 1. bud-like..... | 14. TORTULA. |
| 2. capituliform..... | 15. BARBULA. |

B. Double.

a. Dentato-ciliate;

**a. Teeth free at the points. The
Cilia**

- | | |
|---|--------------|
| 1. not cohering at the base... | 16. NECKERA. |
| 2. cohering at the membra-
nous base | |

a. uniform:

* Male flower bud-like.... 17. LESKEA.

β. difform; The Male flower

* bud-like..... 18. HYPNUM.

** capituliform..... 19. BRYUM.

*** disk-like..... 20. MNIMUM.

b. Teeth cohering at the points;

* Male disk-like..... 21. KOELREUTERA.

b. Dentato-membranous:

1. Teeth acuminate: Flower

hermaphrodite.... 22. WEBERA.

2. ——— truncated: Male

flower disk-like.. 23. BUXBAUMIA.

c. Dentato-reticulated: Male flower

1. bud-like..... 24. FONTINALIS.

2. disk-like and also the her-

maphrodite..... 25. MEESIA.

Obs. Since the above method was published the illustrious author has constructed some new genera, the characters of which, together with those of the genera already enumerated, are subjoined in the following Table.

1. *Peristome none.*

1. PHASCUM. Pl. X. f. 3. Linn. Syst. Nat. Schreb. de Phasco. Hedw. I. t. 9, 10, 11, 34, 35.

Capsule with the rudiment of a lid, which never separates, falling from the peduncle unopened.

Obs. To this genus are referred *Ph. subulatum*, *piliferum*, *cuspidatum*, *muticum*, *serratum* SCHREB., and the following new species *crispum*, *patens*, *curvicolium*. The male flowers of *Ph. subulatum* are bud-like; those of *Ph. cuspidatum*, *piliferum*, *crispum*, approach to disk-like.

2. *Peristome naked.*

2. SPHAGNUM. Pl. X. f. 18. Linn. Syst. Nat. Hedw. hist. I. t. 1. f. 1. t. 3. f. 13.

Peristome naked.

Male Flower club-shaped, on the extremity of the uppermost branchlets: follicles within the axils of its leaflets, surrounded by a succulent thread.

Obs. The species are *Sph. cymbifolium* and *capillifolium*. These at first sight seem to agree, whence Linnæus and others have made the second a variety of the former; but the size of the leaves is a constant mark of a specific difference between them, since I have found both species of their proper form growing in the same place. HEDW.

78 HEDWIG'S TERMS, &c. MOSSES. Genera.

3. HEDWIGIA. Pl. X. f. 6. *Ehrhart Han. Mag. Hedw.*
I. t. 40. III. t. 5. a. t. 11.

Peristome naked.

Male Flower bud-like in the axils of the leaves, monoicous.

Obs. *Bryum apocarpum* β . Lin. is referred to this genus under the name of *H. ciliata*.

4. GYMNOSTOMUM. *Hedw. hist. II. t. 7. f. 31. Hedw.*
I. t. 5, 6, 29, 30. II. t. 24. III. t. 30.

Peristome naked.

Male flower disk-like, dioicous.

Obs. To this genus belong *Bryum pyriforme, truncatulum, pusillum*. Lin.

3. *Peristome* figured, single.

5. TETRAPHIS. Pl. X. f. 7. *Hedw. hist. II. t. 7. f. 32.*

Peristome figured, single; teeth four, entire, pyramidal.

Male Flowers 1. capituliform, 2, 3, 4, elevated from a common perigonium like the female.

2. a flowering powdery head, becoming like a glass, and filled with deformed bodies, empty.

Obs. *Mnium pellucidum* Lin. is referred to this genus.

6. OCTOBLEPHARUM. *Hedw. III. t. 6. a.*

Peristome single, eight-toothed, case without an apophysis.

Obs. *Octoblepharum albidum* Hedw. is *Bryum albidum* Lin.

7. SPLACHNUM. Pl. X. f. 8, 9. *Hedw. hist. II. t. 7. f. 33.*
Hedw. II. t. 11, 12, 13, 14, 15, 16, 17, 18, 38. III.
t. 40.

Peristome single, eight-toothed, teeth in pairs, the apophysis of the case obconical and umbrella-shaped.

Flowers hermaphrodite, dimorphous; pistils of the disk-like flowers barren, of the elongated flowers fertile.

Obs. To this genus belong *Spl. ampullaceum, sphaericum, &c.* Lin.

8. PTERYGYNANDRUM. *Hedw. IV. t. 6, 7, 20. 39.*

Peristome single, sixteen-toothed.

Flower male and female axillary.

Obs. Hedwig has referred to this genus *Hypnum gracile, filiforme, lacuum*, Lin., and *Hypnum fulgens*, Swartz. with the same trivial names.

9. LEERSIA. Hedw. I. t. 18, 19. II. t. 23.

Peristome single, sixteen-toothed, teeth narrow, becoming erect.

Male Flower bud-like from the axils of the leaves only.

Obs. *Bryum extingtorium* α . β . Lin. are *Leersia vulgaris* and *ciliata* Hedw. *B. pulvinatum* Lin. is also referred to this genus.

10. GRIMMIA. Hedw. hist. II. t. 7. f. 35. 36*. Hedw. I. t. 38, 39. III. t. 31. *a*.

Peristome single, sixteen-toothed, teeth broadish, becoming reflected.

Male Flowers in the axils of the leaves, and at the summit.

Obs. *Bryum apocarpum* α . Lin. is *G. apocarpa*. Hedw.; *B. setaceum* Syst. veg. is *G. recurvata*: *B. striatum*. α . β . γ . δ . Lin. are referred also to this genus by Hedwig.

11. WEISIA. Hedw. I. t. 7, 8. II. t. 29. III. t. 5. *b*. 34, 35, 39.

Peristome single, teeth sixteen, entire.

Male Flower at the summit, capituliform, dioicous.

Obs. *Bryum viridulum* Lin. belongs to this genus.

12. POLYTRICHUM. Hedw. hist. II. t. 7. f. 37. Hedw. I. t. 13, 14, 15, 17.

Peristome single, teeth thirty-two, entire, with a membrane attached to their points.

Male Flower disk-like.

Obs. *Polytrichum commune*, *urnigerum*, &c. Lin. are species of this genus.

13. TRICHOSTOMUM. Pl. X. f. 13. Hedw. hist. t. 8. f. 44. Hedw. I. t. 27. II. t. 25. III. t. 2, 14, 37.

Peristome single, teeth sixteen, bifid, long, erect.

Male Flower bud-like.

Obs. The divisions of the teeth become erect, when the capsule falls off, and remain so.—*Bryum hypnoides* Lin. is *Tr. lanuginosum* Hedw.

14. FISSIDENS. Hedw. hist. II. t. 8. f. 45, 46. Hedw. II. t. 31, 32. III. t. 13, 26, 27, 28, 29, 30. *a*.

Peristome single, teeth sixteen (bifid) shorter, inflected.

Male Flower bud-like in the axils of the leaves.

Obs. *Hypnum bryoides*, *taxifolium*, *adiantoides*, &c. Lin. are referred to this genus by Hedwig.

86 HEDWIG'S TERMS, &c. MOSSES. Genera.

15. DICRANUM. Hedw. hist. II. t. 8. f. 41, 42. Hedw.
I. 26, 33. II. 29. b. 30, 33, 34. III. 1, 9, 24, 32,
33, 34. a.

Peristome single, teeth sixteen, shorter, bifid, inflected.

Male Flower capituliform, at the summit of a distinct plant.

Obs. The teeth in this and the former genus (which differ only in their flowers) are inflected more or less. — *Mnium purpureum*, *Bryum scoparium*, *Heteromallum simplex*, *aciculare*, *pellucidum*, and *glaucum*, Lin. are referred to *Dicranum*.

16. DIDYMODON. Hedw. I. t. 28. III. t. 4.

Peristome single, with eight or sixteen pairs of teeth.

Male Flower axillary, or terminating.

17. SWARTZIA. Hedw. II. 26, 27, 28.

Peristome single, with sixteen pairs of teeth, the case without an apophysis.

Flower hermaphrodite, terminating.

18. TORTULA. Pl. X. f. 11. Hedw. hist. II. t. 8. f. 38, 39.

Peristome single, ciliate; cilia spirally convolute.

Male Flower bud-like, monoicous.

Obs. *Bryum murale* and *subulatum* Lin. are made species of this genus, which is named *Tortula* from the twisting of the cilia.

19. BARBULA. Hedw. I. t. 32. III. t. 6. b. 31.

Peristome single, ciliate; cilia spirally convolute.

Male Flower capituliform, dioicous.

Obs. *Bryum rurale* and *ungiculatum* Lin. are species of this genus, and *Mnium selaceum* Lin. is *B. convoluta* of Hedw. — These two genera might be conjoined from the peristome, but on account of a remarkable difference in the male flowers, Hedwig has preferred making them distinct genera.

4. *Peristome* figured, double.

20. NECKERA. Hedw. hist. II. t. 8. f. 47, 48, 49. Hedw.
III. t. 15, 16, 17, 18, 19, 20, 21, 22, 23.

Peristome double, the outer toothed, teeth sixteen, cilia free at the top.

Male Flower bud-like, dioicous.

Obs. *Sphagnum arboreum*, *Fontinalis pennata*, *Hypnum crispum*, *curtipendulum*, &c. Lin. are made species of *Neckera*.

21. LESKEA. Pl. X. f. 14. Hedw. hist. II. t. 10. f. 62, 63, 65. Hedw. I. t. 12. IV. t. 1, 2, 9, 10, 11, 17, 40.

Peristome double; outer toothed, teeth sixteen, acute; inner ciliate, cilia uniform, connected at the membranous base.

Male Flower bud-like, dioicous.

Obs. *Hypnum paludosum*, *filifolium sericeum* Lin. &c. are by Hedwig referred to Leskea.

22. HYPNUM. Hedw. IV. t. 3, 4, 5, 8, 12, 13, 14, 15, 16, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38.

Peristome double; outer toothed, teeth sixteen, acute; inner ciliate, cilia difform, arising from a membrane.

Male Flower bud-like, dioicous.

Obs. *Hypnum abietinum*, *filičinum*, *rutabulum*, *parietinum*, &c. Lin. are species of this genus.

23. BRYUM. Hedw. I. t. 20. III. t. 38. b.

Peristome double; outer toothed, teeth sixteen, acute; inner ciliate, cilia difform, arising from a keeled membrane.

Male Flower capituliform, dioicous.

Obs. *Bryum argenteum*, *Mnium pyriforme*, *annotinum*, *androgynum* Lin. are referred to this genus.

24. MNIUM. Hedw. hist. II. t. 10. f. 67. Hedw. I. t. 37. II. t. 39. III. t. 7, 8, 38. a.

Peristome double, outer toothed, teeth sixteen, acute; inner ciliate, cilia difform, arising from a membrane.

Male Flower disk-like, dioicous.

Obs. *Mnium fontanum*, *palustre*, *bornum*, *capillare*, *crudum*, *punctatum*, *undulatum*, *cuspidatum*, *Bryum cespititium*, *rubens* Lin. are made species of *Mnium* by Hedwig.

25. KOELREUTERA. Hedw. hist. II. t. 10. f. 58. 60.

Peristome double, outer toothed, teeth sixteen, cohering at the apex, oblique; inner ciliate, cilia sixteen, membranous, flat.

Male Flower disk-like, dioicous.

Obs. *Mnium hygrometricum* Lin. belongs to this genus.

26. ORTHOTRICHUM. Hedw. II. t. 35, 36, 37.

Peristome double; *outer* sixteen-toothed, teeth becoming re-
flected; *inner* processes filiform, white, linear, exscisso-
fimbriate.

Male Flower bud-like, axillary, and capituliform, terminating.

Obs. *Bryum striatum* Lin. with its varieties are made distinct species
of *Orthotrichum* by Hedwig.

27. TIMMIA. Hedw. I. t. 31.

Peristome double; *outer* sixteen-toothed, teeth acuminate;
inner processes arising from a membrane, jointed, united at
the extremities.

Male Flowers monoicous, bud-like, peduncled, axillary.

28. POHLIA. Hedw. I t. 36.

Peristome double; *outer* sixteen-toothed; *inner* a sixteen-
toothed membrane.

Flowers from the summit of the trunk, dioicous; *male* capi-
tuliform.

TERMS & DEFINITIONS

used by

LINNÆUS & OTHER WRITERS,

IN THEIR DESCRIPTIONS OF THE

FUNGI.

- I. WRAPPER, *volva*, a membrane envelopping completely some species of Funguses in their young and unexpanded state. Pl. XI. f. 14. a. a. a.

Obs. This is not the part named *volva* by Linnæus. See Curtain, p. 85.

a. SUBSTANCE.

Membranous, *membranaceus*. Coriaceous, *coriaceus*.

b. DURATION.

Fugacious, *fugax*, disappearing very soon after it is burst. Persisting, or Permanent, *persistens* s. *permanens*, continuing as long as the rest of the fungus.

II. ROOT, *radix*.

a. FIGURE.

Bulbous, *bulbosa*, (6). Fibrous, *fibrosa*, (4). Fusiform, *fusiformis*, (5).

- III. STALK, *stipes*, the trunk, or part which supports the Pileus, when this is present.

a. SUBSTANCE.

Solid, *solidus*, (27). Pl. XI. f. 15. c.

Pithy, *inanis*, (28).

Stuffed, *farctus*, completely filled with pith.

Tubular, *tubulosus* s. *fistulosus*, perfectly hollow. Pl. XI. f. 16. c.

b. FIGURE.

Cylindrical, *teres* s. *cylindricus*, (49). Conical, *conicus*, (830).

Filiform, *filiformis*, (441).

Incrassated, *incrassatus*, becoming thicker; above, *sursum*; at the base, *basi*.

Attenuated, *attenuatus*, tapering; upwards, *sursum*; downwards, *deorsum*.

Acuminate, *acuminatus*, pointed; at the top, *apice*; at the base, *basi*.

Bulbous at the base, *basi bulbosa*.

c. SUBSTANCE.

Tender, *tener*. Brittle, *fragilis*.

Tough, *tenax*. Elastic, *elasticus*.

Fleshy, *carnosus*. Woody, *lignosus*.

Cracking, or Chinky, *rimosus*.

Splitting, *fissilis*.

Twisted, *tortus* s. *contortus*.

d. DIMENSIONS.

Long, or Tall, *longus* s. *procerus*.

Short, *brevis*, &c.

Thick, *crassus*. Slender, *gracilis*.

e. INSERTION.

Central, *centralis*, inserted in the centre of the pileus.

Eccentric, *eccentricus*, inserted at some distance from the centre of the pileus.

Lateral, *lateralis*, inserted in one side of the pileus.

f. DIRECTION.

Straight, *rectus*. Erect, *erectus*.

Curved, *curvatus*, &c. &c.

g. CLOTHING.

Hirsute, *hirsutus*. Hairy, *pilosus*.

Velvety, *velutinus*. Silky, *sericeus*.

Woolly, *lanatus*. Tomentous, *tomentosus*.

Scurfy, or Branny, *furfuraceus*, covered with branny scales.

Powdery, *pulverulentus*, sprinkled with a powder.

Tufted, *plumosus*, having feathery tufts.

Veiled, *velatus*, furnished with a curtain or veil.

Ringed, *annulatus*, furnished with a ring. Pl. XI. f. 16. d.

Ringless, *annulo destitutus*.

Collared, *collari instructus*, surrounded by a collar at the top, into which the gills are inserted. Pl. XI. f. 17.

a. b. c. d.

Obs. The collar is not in contact with the stalk, and might, therefore, be considered with more propriety as belonging to the pileus.

h. COLOUR. See Pileus, p. 87.

i. JUICE.

Watery, *aquosus*, the juice colourless and insipid.

Lactescent, or Milky, *lactescens* s. *lactifluus*, pouring out a milky juice when wounded.

Yellow, *flavescens*, pouring out a yellow juice.

Viscid, *viscidus*, besmeared with a viscid juice,

Peppery, *piperatus*, when the juice is acrid.

IV. CURTAIN, or VEIL, *velum*, a thin membrane connecting the margin of the pileus with the Stalk. Pl. XI. fig. 16. b. b.

Obs. The term *volva* is applied to this membrane by Linnæus, who considers it as the calyx of the fungus.

a. DURATION.

Fugacious, *fugax* s. *evanescens*, of short continuance, tearing as the pileus expands.

b. SUBSTANCE, &c.

Membranous, *membranaceum*.

Woolly, *lanatum*. Tomentous, *tomentosum*, &c.

V. RING, *annulus*, the relique of the curtain remaining attached to the stalk. Pl. X. f. 15. d.

a. DURATION.

Fugacious, *fugax*. Permanent, *persistens*.

b. SITUATION.

Approximate, *approximatus*, near the pileus.

Remote, *remotus*, at a distance from the pileus.

c. SIZE and SUBSTANCE.

Indistinct, *obsoletus*, scarcely perceptible.

Broad, *latus*.

Entire, *integer*. Torn, *lacer*.

Woolly, *lanatus*. Cottony, *gossypinus*.

Cob-web-like, *araneosus*.

d. COLOUR.

White, *albus*. Yellow, *flavus*, &c.

VI. PILEUS, *pileus*, the cap of a fungus, or the broad expanding part, placed horizontally on the top of the stalk and supporting the fructifications. Pl. XI. f. 14, 15, 16, 17.

Obs. It may be properly considered as the receptacle, and is furnished with Gills, Tubes, Prickles, Veins, Reticulations, or is perfectly even.

a. FIGURE.

- a. Circular, *orbicularis* s. *orbiculatus*.
Semicircular, or Halved, *semicircularis* s. *dimidiatus*.
Fan-shaped, *flabelliformis*, &c.
- b. Convex, *convexus*. Conical, *conicus*.
Ovate, *ovatus*. Semi-ovate, *semiovatus*.
Hemispherical, *hemisphaericus*.
Campanulate, *campanulatus*.
Funnel-shaped, *infundibuliformis*.
Acuminate, *acuminatus*. Acute, *acutus*.
Bossed, *umbonatus*, having a prominent point or boss (*umbo*), in the centre.
Cushion-like, *pulvinatus*.
Umbilicate, *umbilicatus*, with a depression in the centre like a navel.
Flat, *planus*. Flattish, *planiusculus*.
Concave, *concauus*

b. SURFACE.

- Shining, *splendens* s. *nitidus*, glossy.
Even, *laevis*. Rough, *scaber* s. *asper*.
Warty, *verrucosus*. Plaited, *plicatus*.
Silky, or Satiny, *sericeus*. Velvety, *velutinus*.
Tufted, *plumosus*, having feathery tufts.
Flocculent, *floccosus*, covered with a flocculent substance.
Scaly, *squamatus* s. *squamosus*.
Reticulated, *reticulatus*, having a kind of net-work on the surface.
Powdery, *pulverulentus*. Scurfy, *furfuraceus*.
Cracking, or Chinky, *rimosus*.

c. MARGIN.

- Deflected, *deflexus*, hanging down.
Involute, *involutus*. Revolute, *revolutus*.
Undulated *undulatus*. Crenate, *crenatus*.
Lobed, *lobatus*. Cloven, *fissus*.

d. SUBSTANCE.

- Membranous, *membranaceus*.
Thin, *tenui*. Scariose, *scariosus*.
Fleshy, *carnosus*. Coriaceous, *coriaceus*.

e. JUICE.

- Milky, *lactescens*. Yellowish, *flavescens*.
Watery, *aquosus*.

f. COLOUR.

Pale, *pallidus*. Whitish, *albidus*.
 White, *albus*, &c.
 Grey, *griseus*. Ash-coloured, *cinereus*.
 Somewhat Ash-coloured, *subcinereus*, or *cinerascens*.
 Straw-colour, *stramineus*, somewhat straw-coloured.
 Yellow, *luteus* s. *flavus*. Yellowish, or becoming yellow,
subflavus, *flavescens*, *lutescens*.
 Saffron-colour, *croceus*. Tawny, *fulvus*.
 Orange, *aurantius*. Ochrey, *ochraceus*.
 Tile-colour, *testaceus*. Fawn-colour, *cervinus*.
 Chesnut-colour, *castaneus*. Liver-colour, *hepaticus*.
 Bay, *badius* s. *spadiceus*.
 Brown, *fuscus* s. *brunneus*. Brownish, or becoming brown.
subfuscus, *fuscescens*.
 Flesh-colour, *incarnatus* s. *carneus*.
 Rose-colour, *roseus*.
 Red, *ruber*. Scarlet, *coccineus*.
 Reddish, *rufus* s. *rubellus*, *rufescens*.
 Blood-colour, *sanguineus*. Rust-colour, *rubiginous*.
 Green, *viridis*. Olive, *olivaceus*. Glaucous, *glaucus*.
 Greenish, *virescens* s. *subviridis*.
 Violet, *violaceus*. Blue, *cæruleus*.
 Livid, *lividus*. Purple, *purpureus*.
 Purplish, or Becoming purple, *purpurascens*.
 Black, *niger*. Sooty, *fuliginosus*.
 Blackish, Becoming black, *subniger*, *nigricans*.
 Spotted, *maculatus*, having spots of a different colour.
 Zoned, *zonatus*, having zones or concentric circles of a
 darker or different colour.
 Variegated, *variegatus*.

Obs. 1. *Somewhat* applied to colour would be better expressed by *sub* in composition as Somewhat straw-coloured, *substramineus*; Somewhat brown, or brownish, *subfuscus*; or the termination *ellus*, as reddish, *rubellus*, &c. &c. &c.—And *Becoming* or *Turning* by the termination *escens*, *ascens* or *icans*, as Becoming green, *virescens*, Becoming brown, *fuscescens*, Becoming purple, *purpurascens*, Becoming black, *nigricans*. But this distinction has not been strictly attended to.

Obs. 2. *Pale* prefixed to a colour is expressed by *dilute*, *pallide*, or *pallidus*; as pale yellow, *dilute* s. *pallide flavus*, pale flesh-colour, *incarnato-pallidus* s. *carneo-pallidus*. *Dirty*, by *sordide*, as Dirty white, *sordide albus*, dirty yellow, *sordide flavus*, &c. &c. Watery, by *aquose*, as Watery white, *aquose albus*.

Obs. 3. Mixed or compound colours are expressed by compound words; e. g. a mixture of red and violet, or red and brown, by red-violet, *rubro-violaceus*, red-brown, *rubro-fuscus*, &c.—See Page 54.

g. ODOUR.

Goatish, *hircosus*.

h. TASTE.

Peppery, *piperatus*, acrid like pepper.

A. GILLS, *Laminae*, the flat thin plates, attached to the under side of the pileus of an Agaric, formed of a double membrane and including the fructifications.

a. DISPOSITION.

a. Uniform, or Equal, *uniformis* s. *aqualis*, all of equal size, and form. Pl. XI. f. 17. a.

Difform, or Unequal, *difformis* s. *inaequalis*, of different magnitude and form. Pl. XI. f. 17. b. c. d.

b. In pairs, or Two in a set, *duplici ordine digestae*, a long one and a short one placed alternately. Pl. XI. f. 17. a.

Three, Four, &c. in a set, *triplici, quadruplici, &c. ordine digestae*, a long one and two shorter ones, or a long one and three shorter ones, &c. succeeding each other. Pl. XI. f. 17. c. d.

c. Regular, *regulares*, the sets consisting of equal determinate numbers. Pl. XI. f. 17. b. c. d.

Irregular, *irregulares*, in unequal sets, e. g. some of them being three in a set, others four, &c. &c. Pl. XI. f. 17. e.

b. INSERTION.

a. Decurrent, *decurrentes*, attached to, and running to some distance down upon the stalk. Pl. X. f. 15. b.

Fixed, *stipiti adnexae*, attached to the stalk. Pl. XI. fig. 15. a.

Loose, *liberae*, none of them attached to the stalk. Pl. XI. f. 16. a. a.

Obs. In some Species the loose gills are attached to a collar. See Collar. And at the circumference of the pileus, some of the uniform gills remain separate, others are conjoined.

c. DIVISION.

Simple, *simplices*.

Bifid, *bifida* s. *bifurca*. Pl. XI. f. 17. g.

Obs. By some Writers *bifida*, *trifida*, &c. are used in the same signification, as *duplici, triplici, &c. ordine digestae*, but a distinction ought to be made, as the gills, which are two or three in a set, are generally unattached to each other at both extremities.

Branched, *ramosae*.

Anastomosing, *anastomosantes*, the branches of one gill uniting with one another, and with those on each side of it. Pl. XI. f. 17. b.

Labyrinth-form, *labyrinthiformes*, running much into one another.

d. NUMBER and DISTANCE,

a. Few, *paucæ* s. *raræ*. Numerous, *creberrimæ*.

b. Distant, *distantes* s. *remotæ*. Crowded, *confertæ*.

e. MAGNITUDE.

a. Long, *longæ*, compared with one another.

Middle-sized, *mediocres*.

Short, *breves*.

b. Broad, *latæ*. Narrow, *angustæ*.

f. LOWER MARGIN.

a. Horizontal, *horizontales*, flat, in a straight line.

Convex, *convexæ*. Concave, *concavæ*.

Bowed, *arcuatæ*.

b. Crenate, *crenatæ*. Serrated, *serratæ*.

Toothed, *dentatæ*. Laciniated, *laciniatæ*.

c. Undulated, *undulatæ*. Flexuose, *flexuosæ*.

Curled, *crispæ*.

g. SUBSTANCE.

a. Tough, *tenaces*. Brittle, *fragiles*.

Fleshy, *carnosæ*. Thin, *tenuæ*.

Somewhat gelatinous, *subgelatinosæ*.

h. APPENDAGES.

Clawed, *unguiculatæ*, furnished with a long narrow portion, or claw, *unguis*.

i. COLOUR. See Page 87.

Obs. The Colour of the Gills is found to be much more constant than that of the Pileus, or any other part of the Fungus, and is therefore a very proper foundation for the subdivisions of the Agarics.

B. TUBES, *tubi*, attached to the under side of the pileus in the stipitate *Boleti*, and including the fructifications. Pl. XI. fig. 18.

a. CONNECTION.

a. Distinct, *sejuncti*, not adhering to each other.

b. United, *conjuncti*, cohering with one another.

b. LENGTH.

a. Long, *longi*. Short, *breves*.

Unequal, *inæquales*, of unequal length.

c. INSERTION.

a. Decurrent, *decurrentes*, running down upon the stem.

d. COLOUR. See Page 87.

Obs. The colour of the Tubes is often found materially different from that of the Pores.

e. EXTREMITY.

PORES, *pori*, the extremities of the tubes.

a. Simple, *simplices*, not comprehending smaller pores.

Compound, *compositi*, having porules, *poruli*, or secondary pores.

Confluent, *confluentes*, running into one another.

Reticulated, *reticulati*, forming a net-work.

b. White, *albi*. Yellow, *flavi*, &c. See Page 87.

c. Equal, *æquales*. Unequal, *inæquales*.

d. Conform, *conformes*. Difform, *difformes*.

e. Round, *teretes*. Rounded, *rotundati*.

Angular, *angulares*. Somewhat angular, *subangulati*.

Four-cornered, *tetragoni*, &c.

Oblong, *oblongi*. Acute, *acuti*.

Very minute, *minutissimi* s. *tenuissimi*.

f. Ciliate, *ciliati*. Sinuous, *sinuosi*.

Flexuose, *flexuosi*. Undulated, *undulati*.

C. PRICKLES, *aculei*, softish solid bodies attached to the under side of the pileus in the genus *Hydnum*, emitting the seeds from their surface.

a. FIGURE.

a. Cylindrical, *cyldraceuti*.

Conical, *conici*. Subulate, *subulati*.

b. DIRECTION.

b. Straight, *recti*. Oblique, *obliqui*.

Incurved, *incurvi*.

c. SITUATION.

Imbricated, *imbricati*. Decurrent, *decurrentes*.

d. MAGNITUDE.

Long, *longi*. Short, *breves*.

e. TOP.

Acuminate, *acuminati*. Obtuse, *obtusi*, &c.

D. VEINS, *venæ*, vessels disposed along the under side of the Pileus in the genus *Merulius*.

Very much Branched, *ramosissima*.

Anastomosing, *anastomosantes*.

Obs. For an explanation of those Terms, which occur in the characters of the remaining Cryptogamous plants, the reader is referred to the Dictionary.

TERMS AND DEFINITIONS

GENERAL

ON FRUIT IN GENERAL

TERMS AND DEFINITIONS

used by

GÆRTNER,

*In his Work De Fructibus & Seminibus Plantarum;
Vol. II. 4to. Stutgardia 1783, & Tubingæ 1791.*

Obs. Except the three first Chapters, which relate to the Distinction of Buds and Seeds, the Ovum, &c. of Vegetables, and the Mode of Fecundation with its effect upon the Ovum, the substance of Gærtner's Introduction is here given. It is somewhat abridged indeed, and the arrangement is in some degree altered, in order to give it more of a Tabular Form.

ON FRUIT IN GENERAL.

The Ovaries or Female Parts of a Flower, which after fecundation have acquired their just form and maturity, alone deserve the name of *Fruit*; but, from custom, that term is applied to every apparatus of organical parts, which succeeds to the place of the flower; provided it be produced for the purpose of supporting, or defending the seed, and its parts have undergone a considerable change in their figure and consistence; Thus, for example, it is usual to consider as Fruits.

1. The *Floral Bractes*, when they are permanent, and becoming enlarged defend the seeds, and together with them form a certain mixed body of a peculiar form. Thus a *Cone* or *Strobile* arises from the bractes of a female ament disposed about the common axis into a conical form, and at maturity converted into a coriaceous, cork-like, or woody hardness, as in the Pine, &c. And a *Galbulus* is formed if the scales are disposed in a globular form, and when mature, being rendered dry, open into targets as in *Cupressus*, or becoming united, put on the form of a soft berry, as *Juniperus*, &c.

2. The *Involucre of the Flower*, as well proper, as common, sometimes assumes the form of a fruit. It resembles a stony nut in *Lithagrostis*, a coriaceous nut of one or two cells in *Xanthium*. It forms a kind of fungous *Theca* in various *Dipsaceæ*. It represents a true valvular capsule in *Fagus* and *Castanea*. And it is converted into a fleshy berry, or into a fungoso-coriaceous cup, in which the nuts of *Taxus*, *Corylus*, *Quercus* are included.
3. The *Chaffs* of the common receptacle, although rarely, pass into membranous conceptacles, as in *Scolymus angiospermus*, &c.
4. The *Calyx* in all *superior flowers* accompanies the ovary to maturity, and in general is so closely united with it, that they form one inseparable body. The *inferior calyxes* moreover very often continue, are very much changed, and invest the fruit in different manners, thus the mature calyxes of *Brunnichia*, and *Rumex spinosus* are indurated, so as to form coriaceous or even nucamentaceous cases; the calyxes of *Acnida*, &c. are softened into a fleshy berry; and those of *Alkekengi* are inflated so as to form a kind of bladder.
5. The *Inner Glumes of Grasses*, which certainly occupy the place of the *Corol*, are frequently converted into a cartilaginous crust, which embraces the seed very closely. The fruit of *Pimpinella* is by *Linnaeus* attributed to the indurated tube of the corol; and the soft fruits of *Basella*, *Morus*, &c. are more properly attributed to the *Corol* than *Calyx*.
6. The *Nectary* is very rarely changed into the *Fruit*, the only instance is in *Carex*, and, according to *Linnaeus*, in *Mirabilis*: But the nut of *Mirabilis* is with more reason ascribed to the indurated belly of the corol.
7. The *Receptacle*, when mature, assumes various and often very peculiar forms, which bear a striking resemblance to true Fruits. Thus in *Anacardium*, *Acajuba*, &c. it is converted into a large pome or berry, upon which the true fruit is placed. It resembles a turbinate honeycomb in *Nelumbo*. It is expanded into a fleshy cake in *Dorstenia*. In *Ficus* it is formed into a hollow fleshy globe, pervious at the top. In *Gundelia* it is divided into wedge-shaped fungous lobules, each containing one seed. And in *Fragaria* it passes into an agreeable berry.
8. The *Ovaries*, when produced in clusters, or more than one, and united into a definite form, are simply named the *Fruit*. Thus the united seeds of the *Umbelliferous* plants, the conjoined pericarps of *Ananas*, *Rubus*, &c. are taken collectively and styled simply the *Fruit*, &c.

According to the more general signification of the Term Fruit, we may consider first, its various relations with the neighbouring parts; secondly, its accidental affections, depending upon number, situation, combination, &c.; thirdly, its proper qualities, founded on the fabric and structure, as well internal, as external.

With respect to the neighbouring parts, which exist together with the Ovary, a Fruit is

Naked, *nudus*, when the whole of the ovary immediately offers itself to our view, unaccompanied by any extraneous part; or when it is so veiled that we can see quite to its base, either all round, or at least on one side, as in *Cerasus*, *Lilium*, *Galium*. To this head belong many seeds, which are called *naked*: However, every naked seed is not to be considered as a naked fruit, for the sole defect of a conspicuous pericarp constitutes a naked seed, and therefore a seed may be naked, although it be concealed by other parts, as in *Lithagrostis*, *Xanthium*, &c. But a naked fruit does not admit of any concealment.

Covered, *tectus*, when the ovary is covered in such a manner by the parts only, which are proper to the flower, that the eye has sometimes a greater, sometimes a less access to it, and when those parts were not united with the ovary before its impregnation, as the calyx in all the *inferior fruits*. It is subdivided into

- a. Veiled, *velatus*, when the covering is on all sides free and detached from the ovary, and is so far open that the ovary is not wholly withdrawn from our view. These coverings sometimes proceed from the calyx, as in *Hyoscyamus*; sometimes from the corol, as in *Drosera*; and sometimes from the receptacle, as in *Nelumbo*; and
- b. Coated, *tunicatus*, when the covering at maturity is either completely united with the ovary, or is at least so drawn over it, that there is only a very narrow passage to this part, so that it cannot be seen without tearing or loosing the parts of the covering: In this way the Ovary is covered by the calyx in *Rosa*, *Alchemilla*, &c.; by the corol in *Panicum*, &c.; by the nectary in *Carex*; and by the receptacle in *Ficus*; unless the fruit of this last genus may more properly be referred to the *involucrad*.

Obs. These *coated* fruits, which derive their covering from the calyx, are not to be confounded with *inferior* fruits, to which they are nearly

allied. In the coated fruits the style may easily pass through the rind of the fruit, or at least did pass freely through it, before the perfect maturity of the fruit, and the ovary itself is either not at all, or, at least, only partially, coalesced with the rind. Whilst in the true *inferior* fruits, the style, ovary, and rind are united into one inseparable body. The canon of Linnæus "That a superior flower, and consequently an inferior fruit, is one, of which the calyx passes into the fruit" is to be admitted with caution, or it may lead us into an error.

Involucred, *involucratus*, when the ovary derives its covering from parts placed without the flower, or proper calyx, and is wholly, or only partially concealed by it. To this place belong all the above-mentioned fruits, which are accompanied till their maturity, and more or less covered by the *floral scales*, by the *common* or *proper involucre* of the flower, by the *chaffs* of the *receptacle*, or by the *common receptacle* itself. Hence they often resemble *naked* fruits, after they are perfectly ripened, as in *Pinus*, &c.; are sometimes like the *veiled*, as in *Quercus*, *Corylus*, *Taxus*; and sometimes agree with the *coated*, as in *Juniperus*, *Scabiosa*, &c.

Obs. The Involucre is either *universal*, or *partial*, or *compounded* of both. The *Universal* embraces all the ovaries, and has nothing like it in the same apparatus, as the Spathe in *Phoenix*, the Sheath in *Maycis*, the Echinus in *Castanea*, &c. The *Partial* sometimes comprehends a single, sometimes several aggregate ovaries, and is found repeated in the same apparatus, as the Scales of *Pinus*, the Targets of *Cupressus*, the ligulæ of *Lupulus*. The *Mixed* is compounded of both the former, as in *Palmæ*, *Dipsacæ*, and *Compositæ*.

To the *Accidental* or *Extrinsic Affections* of Fruits are referred their *figure*, *number*, *combination*, *situation*, *magnitude*, and *colour*.

A. FIGURE *figura*. This is so various that a general view can scarcely be of any use, and a special explanation will be given hereafter.

Obs. The proper figure of the ovary is always to be carefully distinguished from that of the whole fruit; The latter in Amentaceous, Compound, Coated, and Involucred Fruits, assists us in distinguishing them, and ought always to be considered. In the *Amentacæ* the form of the whole fruit is of great use in defining their species: the species of *Pinus*, &c. are more easily distinguished by the form of their strobiles than that of their leaves. In the Conjugate and Compound Fruits, the figure of the whole is often of more consequence than even the form of the flower, for little can be done in the knowledge of the *Umbelliferae*, without an acquaintance with the figure of the fruit, &c. &c.

B. NUMBER, *numerus*. The natural number of the Fruits is the same as that of the Ovaries, yet nevertheless there is often a remarkable difference, because some of the ovaries are generally abortive in polygynous flowers, whence the mature fruits are defective in number.

Obs. This defect in some instances is constant and apparently natural, as in *Hasselquistia*, &c., and various Compound Flowers, in which all the ovaries are never fecundated. In other cases the defect is evidently fortuitous, as in *Pæonia*, &c., in which sometimes more, sometimes fewer, sometimes even none of the ovaries abort. In defining the number of fruits, therefore, the number of the immature ovaries is above all to be examined, as the most certain index of the natural number, the examination is to be repeated in several flowers of the same species, and the number, found in the most of them, is to be regarded as the natural one. We ought not to take only the number of the terminal flower, as is commonly done, unless it be constantly the largest, in which case, as being most perfect, it ought to be considered as more natural. Finally, we ought to be careful lest we attribute a number to any genus, which is only observed in one or two species, otherwise we shall have fallacious generic characters, as far as regards number, as in *Pæonia*, *Nigella*, *Spiræa*. &c.

a. Common, *communis*, the common number comprehends all the fruits of one spike, raceme, head, verticil, or common involucre.

b. Proper, *proprius*, this respects only the fruits of single flowers. It is

a. Singular, *singularis*. Single, solitary fruits are by far the most frequent. They occur in many natural orders, as *Gramina*, *Compositæ*, *Lychnideæ*, &c. &c.

b. Plural, *pluralis*. Many or manifold fruits arise from two or more ovaries in a single flower. They are either

aa. Distinct, *discreti*, as in *Ranunculus*, &c.; or

bb. Conjugate, *coadunati* s. *conjugati*, as in the *Convolvulæ*, *Umbelliferæ*, *Malvaceæ*.

Obs. 1. To distinguish the single from the manifold fruits is not very easy in the *apetalous* and *naked* flowers, especially when the ovaries are placed very near each other, and are accompanied by some accessory parts, of which the nature is ambiguous, so that they may be equally as well taken for the calyx, as for the floral involucre. For in these cases the calculation depends upon the name given to those accessory parts, thus for example, if the *scales* of an Ament bear the name of calyx, then there will be twin fruits in each floret of the Pine; but if, on the other hand, these scales be accounted mere floral bractes, then the fruit of the Pine will be single, but sitting in pairs on each scale of the strobile; and thus in *Arum*, *Zostera*, &c. the fruit will be considered single or manifold, according as the common Spathe is referred to the calyx, or the involucre. In these and similar cases, it seems not improper to consider the fruits as single only, but collected on a common receptacle.

because, from the structure of their Congeners, it appears clearly that neither the ament, nor the spathe can be considered as a true calyx: for in *Carpinus*, *Fagus*, *Quercus*, *Castanea*, the proper calycle, placed upon the ovary, openly refuses the dignity of a calyx to the ament; and in *Palma* the proper calyxes, which are placed under each of the ovaries, strip all spathes universal and partial of the name and office of a calyx, and refer them to mere floral involucre. But these circumstances are commonly considered differently, for to all the plants just named more fruits than one are attributed after each flower, because the opinion is formed from their external habit only.

Obs. 2. To determine the number in the *dissect* fruits is not difficult, but in the *conjugate* or united fruits, it is not equally easy to distinguish a simple from a manifold fruit; wherefore in these the number of the styles, and the opening of the mature fruit is to be carefully attended to. If the styles are equal in number to the parts separating from each other spontaneously at maturity, there can be no doubt but a fruit of that kind belongs to the conjugate as in the *Umbelliferae*, *Callitriche*, &c.; but if there be only one style, then a conjugate fruit is usually distinguished from a simple many-celled fruit from the external habit, and by the following signs, namely, that in the conjugate, first, the style is permanent, and forms the central column, to which the partial ovaries are affixed, as in the *Asperifolia*, *Gerania*, *Malva*; secondly, the partial ovaries separate spontaneously into proper conceptacles of the seeds either closed, or opening elastically, as in the *Verbenae* and *Tricoccae*; thirdly, the common receptacle of the seeds is entirely distinct and loose either from the conceptacles of the seeds in *Acer*, *Nauclea*, &c. or from the axis of the fruit in *Cinchona*, &c.; and fourthly, that the parts of the fruit, which are not entirely loose, open only along their internal suture, as in the *Contortae*. But notwithstanding these attentions, it must be confessed that it is often extremely difficult to distinguish simple from conjugate fruits, and that Nature seems to have passed by such insensible steps from one to the other, by the intermediate *partible* and *lobed* fruits, that it is scarcely possible to fix certain limits between the simple and manifold fruits, thus the same fruit is by some considered as simple, by others as conjugate, as in *Colchicum* *Fraxinella*, &c. But these difficulties arising from number are few.

Most conjugate fruits are evidently

- a. Twin, *geminati*, as in all the *Umbelliferae*, in almost all the *Stellatae*, in many of the *Contortae*, in *Mercurialis*, &c. &c.
- β. Three together, *ternati*, as in the *Palmae*, *Liliaceae*, *Tricoccae*, in *Tropaeolum*, &c. &c.
- γ. Four together, *quaterni*, as in almost all the *Verticillatae*, and *Asperifoliae*, in the *Verbenaceae*, in *Potamogeton*, &c. &c.
- δ. Five together, *quini*, as in *Geranium*, many of the *Malvaceae*, in *Sibbaldia*, &c. &c.
- ε. Six—Ten together, *seni—deni*, and generally manifold fruits, as in *Ranunculus*, and the *Rosaceae*.

Obs. These are commonly called many-capsuled, *multicapsulares*, and many-podded, *multisiliquosi*, fruits. But this title is both too con-

finer, and improper; It is too limited, in as much as it excludes all the fruits with many naked seeds, *fructus gymnopolspermi*, as those of *Fragaria*, *Comarum*, &c. and all formed of mere berries, as those of *Rubus*, &c. And it is improper, because not one of them is compounded of *siliques*, but many of true legumes, as in *Caltha*, *Trollius*, *Helleborus*, *Delphinium*, &c. in all which the seeds are fixed to the internal suture only. These fruits will therefore be named generally *conjugate manifold*, or *many-fruited*, *conjugati multiplices*, aut *polycarpi*.

C. COMBINATION, *combinatio*, supposes distinct parts joined together, and this junction takes place in two ways in Fruits. For either

1. The Conceptacles of the seeds proper to a single flower are united into a body apparently undivided, or at least closely cohering; or
2. The Ovaries of different flowers are compacted into a single fruit.

From the former combination arise *partible* and *lobed* fruits; from the latter *compound* fruits strictly so called.

1. PARTIBLE, *partibiles*, partible fruits before perfect maturity appear very entire, and have an equable surface; but afterwards, without any injury of their proper substance, separate spontaneously into portions, which are very entire, and very similar to each other, and form as many distinct closed conceptacles of the seeds, as there were parts of the fruit. All partible fruits therefore, with regard to number, belong to conjugate fruits; but on account of their external habit and the style being for the most part simple, they are usually reckoned amongst the simple fruits. They are

- a. Two-partible, *bipartibiles*, consisting of
 - a. Two Corticated Seeds, *combinati ex duobus seminibus corticatis*, as *Blairia*, &c.
 - b. Two Capsules, *capsulis duabus*, as *Cinchona*, &c.
 - c. Two Berries, *baccis duabus*, as *Grumilea*, &c.
 - d. Two Drupes, *drupis duabus*, as *Messerschmidia*.
 - e. Two Siliques, *siliquis duabus*, as *Coronopus*, *Iberis*, &c.
 - f. Two Legumes, *leguminibus duobus*, as *Astragalus*.
- b. Three-partible, *tripartibiles*, as many of the *Tricocca*, *Richardia*, &c.
- c. Four-partible, *quadripartibiles*, as *Verbena*, *Cephalanthus*, &c. &c.

Obs. The ovary of *Cephalanthus* is constantly four-partible, but two cells are always abortive.

d. Five-partible, *quinque-partibiles*, as *Tribulus*, &c.

e. Many-partible, *multipartibiles*, as *Aristolochia*, &c. and in a certain respect *Hedysarum*, &c.

2. LOBED, *lobati*, lobed fruits appear manifestly divided into parts, sometimes more, sometimes less deeply; but the parts near the axis are so closely united with each other, that they never separate into closed conceptacles, but constantly secede into valves, except in *Cardiospermus*, the lobes of which open at least at the apex. They differ in their structure, for some are evidently formed of two or three ovaries, as *Cerbera Manghas* and *Annona lobata*; or are separated into lobes, as far as regards the surface, as some of the *Veronicas*, which therefore deserve to be named spurious lobed fruits. But others are so formed from the protuberant back of their valves, and from their margins being inflected towards the axis, that the dissepiments in all these are doubled, and the cells proceed from the valves only, which, at maturity, for the most part separate spontaneously from the axis of the fruit. In these lobed fruits more strictly so named, the style is simple, or if there be more than one, yet the fruit can be wholly impregnated from one of them as is the case in *Hypericum*; wherefore they are deservedly enumerated amongst the simple fruits.

Obs. It has been found from an experiment made on a *Hypericum* that all the ovules may be fecundated in all the cells, by a single style, after the amputation of the rest.

The lobed fruits are

- a. Two-lobed, *bilobi*, these are much more common than the others, they are met with, many of the Ringent plants, &c. They are properly named didymous, *didymi*, when their dissepiment is formed of a double lamina.
- b. Three-lobed, *trilobi*, as in *Colchicum*, *Hypericum*, &c.
- c. Five-lobed, *quinelobi*, as in *Oxalis*, &c.

3. COMPOUND, *compositi*, compound fruits differ essentially from all the above-mentioned, since they are formed of two or more ovaries of different flowers, coalesced into a single fruit.

Obs. They are very rare, because they can only take place where the ovaries are inferior, or from absolutely naked pistils. They are found to be present or absent in the same natural genus.

We have instances of a compound fruit from inferior berries, in *Caprifolium*, *Mitchella*, *Merinda*, *Ananas vesca*, and sometimes *Pavetta*,

in all which the ovaries being coalesced with one another form the fruit, which serves as a common receptacle to the flowers.

Compound Fruits from naked pistils are observed in *Pandanus* and *Sittodium*, which even deserve the title of *superdecompound*.

(These are all the compound fruits which were known to Gærtner, and he observes that they might perhaps be referred to the *aggregate* ones, if their singular habit and structure did not demand a particular place for them.)

D. SITUATION, situs, is one of the principal amongst the extrinsic affections of fruits, and in constancy exceeds almost all the others. It is

1. Common, *communis*, this is referred to the whole plant, and admits of all the modifications, which are observed in the situation of flowers, thus Fruits are

- a. Radical, *radicales*. Cauline, *caulini*. Rameous, *ramei*.
- b. Terminal, *terminales*. Axillary, *axillares*, &c.
- c. Erect, *erecti*. Cernuous, *cernui*, &c.
- d. Spiked, *spicati*. Umbellate, *umbellati*, &c. &c.

2. Partial, *partialis*, this arises from the various distance, observed betwixt the ovaries of the different flowers. Partial Fruits are

a. Separate, *separati*, when they neither have a common receptacle, nor can mutually touch each other, as

a. Remote, *remoti*. Scattered, *sparsi*, &c.

b. Consociated, *consociati*, when they are very near each other, and stand upon a determinate common receptacle.

a. Aggregate, *aggregati*, having either no involucre or only a common one, and the common receptacle very entire, which is either naked, or villous, or chaffy, or beset with the reliques of the flower, so that the ovaries are more or less closely in contact, as in *Sparganium*, *Banksia*, and many of the *Compositæ*.

b. Segregate, *segregati*, collected into one body, as the preceding, but either the common receptacle is divided into various partial ones, or the fruits are separated from each other by partial or proper involucrets,

Obs. In this manner the scales of an ament, like partial receptacles, and involucrets, separate the nuts of *Pinus*, *Carpinus*, &c.; the coriaceous or chaffy cases, like proper involucrets, separate the seeds of *Scotolymus* and the *Dipsacæ*; the fungous cells, engraved in the common receptacle, keep separate the capsules of *Liquidambar*, and the seeds of *Gundelia*; and the chambers, formed from the calyx, and common receptacle, keep disunited the seeds of *Opercularia*.

3. Proper, *proprius*, the proper situation of fruits is of three kinds, superior, intermediate, and inferior.

Fruits are

- a. Superior, *superi*, when the ovary is contained within the flower.

Obs. Superior Fruits are the most common, and this situation is also the most natural on account of the protection, which the immature ovaries derive from the parts of the flower being placed around them, it is observed in many natural families as the *Gramina*, *Verticillatæ*, *Asperifoliæ*, *Lychnidæ*, *Solanaceæ*, *Malvaceæ*, *Siliquosæ*, *Leguminosæ*, all without exception, and in a great number of other genera. It is distinguished from the others by the ovary's having the calyx or corol evidently placed beneath it, or in absolutely naked flowers, by the ovary's having none of the parts of fructification placed upon it except the style, or stigma; for if any other part grows upon it, as the stamen in *Hippuris*, or as that almost invisible sheath of the Style in *Absinthium*, &c., then such ovaries are properly referred to inferior fruits.

- b. Intermediate, *intermedii*, when the ovary is situated between two calyxes, or between the corol and the single calyx.

Obs. The intermediate fruits, except those of the Compound flowers be referred to them, are so unusual, that they scarcely deserve to be considered separately, more especially as they may very properly be transferred to the inferior fruits. For in all of them some part of the flower is placed upon the ovary, and that which lies under it, is more properly accounted a mere involucre, as in *Linnaea*, *Mirabilis*, *Nelitris*, and especially the *Compositæ*, to which ADANSON, with the greatest propriety, has attributed a mere involucre instead of a common calyx.

- c. Inferior, *inferi*, when the flower grows upon the ovary.

Obs. 1. The inferior fruits are not very frequent, but they are observed in various natural orders; as the *Compositæ*, *Umbelliferæ*, *Cucurbitaceæ*, *Myrtoideæ*, and in many of the tribe of *Stellatæ*, *Dipsaciæ*, and *Campanulatæ*.

Obs. 2. The proper situation of most fruits is by the above marks easily defined, and the more easily, because in a great number of plants, the calyx is permanent, and adheres to the mature fruit in the form of a crown or cover. Yet nevertheless the diagnosis of the situation, in the mature fruit, is often attended with great difficulties, as for example, First, when the calyx of an inferior fruit, at maturity, passes into an integument of the seed, or ovary, which is very like a genuine fruit, as in *Spinacia*, &c.; Secondly, when the immature ovary is deeply hidden within the calyx, and intimately coalesced with it, but after full maturity, is entirely loosed from it, and puts on the perfect form of of a superior fruit, as in various species of *Metrosideros*, and *Melaleuca*; and Thirdly, when the same ovary is only partially covered by the calyx, and coalesced with it, and the remainder projects free and unconnected within the cavity of the flower: ovaries of this kind are named *immersed*, as in *Cbry*.

sosplenium, &c.—Not to mention those, in which there does not remain the least vestige of the superior flower after maturity, from which the situation of the parts can be determined, as in *Mirabilis*, various species of the *Compositæ*, &c. Many of these difficulties may be obviated by examining the situation of the ovary in the recently expanded flower; for, if in this state the whole of the ovary is above the proper receptacle of the flower, we may safely declare the subsequent fruit to be superior, although at maturity the whole of it shall be covered, and incrustated by the calyx or corol: as in *Rumex*, &c. On the contrary, if, in that state, the ovary be concealed within the receptacle of the flower, or, if the stamens, and petals be deeply inserted in the calyx above the seat of the fruit, then in the former case the fruit may be boldly referred to the inferior ones, and in the latter from analogy, as in *Alchemilla*, *Agrimonia*, *Rosa*, *Rhexia* and others.—It is carefully to be observed, how far the fruit grows to the calyx, for if there be only a slight, or no connection between these parts, and the stamens be attached to the corol or receptacle, those fruits must be referred to the superior coated ones, as in *Saxifraga*, &c.; but if one third part, or one half of the calyx be coalesced with the fruit, or have formerly been so, these fruits are to be referred to the inferior ones; as in *Samolus*, &c. Finally the involucred fruits, unless there be a manifest superior calyx, are never to be mixed with the genuine inferior ones; and it is to be duly weighed what analogy, and the structure of congener plants point out, especially in the calyx-flowered plants, lest the natural genera be unnecessarily broken down: And in very doubtful cases, we are to decide in favour of the superior, rather than the inferior situation, because it is both more frequent, and more natural. Whatever be the proper situation of fruits, it is to be held as an axiom, that in one and the same natural genus it cannot be double, or different, but the species ought to be referred to different genera, hence *Crinum asiaticum*, and *Houstonia purpurea* cannot properly remain under one genus with the other species.

E. COLOUR, *color*, this is so various, and variable, as not to be worthy of notice,

F. MAGNITUDE, *magnitudo*, this is also very variable. But it may be generally remarked that the *thickest* fruits are found in the *Palmae* and *Cucurbitæ*, and the *longest* in the *Leguminosæ*; for the berry of *Lontarus maldivica* is frequently a foot and a half thick, and the legume of *Mimosa scandens* is often six English feet in length. And in the distribution of the *Umbelliferae* the size of the fruits is every where reckoned; but in these the proportion of the thickness to the length seems to be of greater moment, than the sole consideration of the relative size, although even this is not to be absolutely neglected, especially in the specific differences.

Amongst the proper and intrinsic qualities of Fruits, their CONSISTENCE and FABRIC, as well external, as internal, are chiefly deserving of notice.

Obs. The consistence of the immature ovary is always soft, and herbaceous; but when it approaches to maturity, it generally experiences a double lot: For it either becomes thinner, and acquires rather a greater size; or it becomes thickened and enlarged in all its dimensions, and suffers various changes in its consistence. Thus in the former case, the ovary, which was before somewhat plump, in all the naked seeds as they are called, is extenuated to such a degree, that at length it unites with the seed, and with it becomes one body. In like manner in some of the *Verbenaceæ*, the soft substance of the ovary, by which the ovules were kept bound together, at maturity becomes perfectly dry, so that the seeds, no longer surrounded by a common cover, spontaneously fall asunder. So likewise in *Sicyos*, the immature thickish berry gradually shrivels so much, that it at length becomes a very thin pellicle spread over the seed, which could scarcely be supposed ever to have been a berry. In these and some other cases, the substance of the ovary is lost at maturity, or at least is so far diminished, that it appears to be lost. In all the others it acquires an addition to its bulk, &c. at maturity.

A. CONSISTENCE, *consistentia*, mature fruits with respect to their consistence may be considered in general as three-fold, viz.

1. Hard, *duri*, which are by much the most frequent, for all are considered as hard, which are apparently formed of an uniform, juiceless substance.

Obs. The degrees of hardness are innumerable from stony, which can scarcely be cut with steel, to spongy, or membranous which may be easily compressed with the fingers.

2. Soft, *molles*, none are accounted soft except true Berries, which are formed entirely of a soft succulent flesh or pulp.
3. Mixed, *mixti*, these are chiefly *Pomes* and *Drupe*s; yet all other fruits may be referred to this class, which are manifestly constructed of two different substances, so that one serves for an integument to the other, and the outer may be accounted the rind of the fruit.

B. EXTERNAL FABRIC, *fabrica externa*.

A True Rind, *cortex verus*, is not found in all fruits; in many there is only a simple Cuticle, and in a great many, there is not even this. The cuticle is rarely considered except in succulent

Berries. The *Consistence*, *Connexion*, and *Texture* of the Rind are to be considered, and also its *Opening*.

The *Consistence* of the Rind, with regard to the internal parts is three-fold, 1. A softer rind covers a harder internal part as in *Drapes*. 2. A harder rind is spread over a softer part, as in *Punica*, *Cacao*, &c., these fruits are strictly named *Corticated*, *corticati*. 3. The consistence of both parts is nearly equal, but the colour, or texture form a difference between them, as in *Citrus*.

The *Connection* between the Rind and the internal part is constantly very close, and scarcely to be dissolved till after full maturity. Yet, in some instances, the rind is not only naturally loose from the internal part, but is even found removed to a considerable distance from it, so that one fruit appears contained within another, as in *Scytalia*, *Cysticapnos*, *Nigella damascena*, and in some measure in *Onobrychis*; these fruits may be named *emphysematous*, and are to be carefully distinguished from the *inflated*.

The proper *Texture* of the Rind is for the most formed of one very entire, uniform, and continuous substance; hence in almost all fruits the surface, if not equable, appears undivided. But in some the Rind is full of holes (*foraminulentus*) as in *Onobrychis*; in others it is composed of distinct tubercles, as in *Sitodium* and *Scytalia*; and again in others it is formed of separate cartilaginous scales joined like a coat of mail, as in *Rotanga* and *Sagu*, these fruits therefore deserve the name of *loricated*, *loricati*.

The *Mode of Opening* is various. For some Fruits preserve their form unchanged, or at least never open in a regular manner, these are on that account named *Valveless* (*evalves*). Others, at maturity, are spontaneously separated into regular parts, or open with holes of a determinate number or place, these are named *Valved* (*valvati*). They open with one or two terminal *Pores*, as *Jungia*, many of the *Antirrhina*, &c.; with two, three, or more lateral pores, as *Phyteuma*, *Campanula*, *Papaver*; and with a single one in the base, as *Momordica Elaterium*, and various *Asperifoliae*.

The *Valved Opening* (*dehiscencia valvata*), differs in the direction, extent, situation, and number of the divisions.

The *Longitudinal division* is the most frequent. It is *Complete*, *completa*, when it runs from the vertex to the base, as in *Lilium*, &c.

Incomplete, *incompleta*, when it extends only to the middle of the back, as in *Chrysosplenium*, &c.; or when it only extends a little below the apex, as in *Primula*, &c. The former fruits are named *half-valved*, *semivalvati*; the latter are said to open with teeth.

The Transverse, or horizontal division is exceedingly rare, it occurs either in *circumcised* fruits, *fructibus circumscissis*, which open horizontally into two patulous valves, as in *Centunculus*, *Anagallis*, *Portulaca*; or in *jointed* fruits, which separate transversely into proper closed conceptacles of the seeds, as in *Hedysarum*, &c.

A Two-fold Place of division is generally to be observed besides those just mentioned, viz. one in the belly, another in the back of the fruit.

Fruits are said to open *inwards*, which open along a suture turned towards the axis, as in *Delphinium*, *Colchicum*, &c. They are said to open *outwards*, when the opening takes place in the back, as in *Oxalis*, *Pyrola*, &c. But whether a fruit opens from the base upwards as in *Triglochin*, or from the vertex downwards, as in most others, is of no importance.

The number of the sections defines that of the valves, and although a fruit only separates at the apex into teeth, it is considered from the number of these as well as from the number of valves, *one, two, three, four, or many-valved*.

Valves, *valvulae*, agree in properties with the fruits, and are

- a. Membranous, *membranaceae*. Coriaceous, *coriaceae*, &c.
- b. Soft, *molles*. Rigid, *rigidae*. Elastic, *elasticae*.
- c. Flat, *planae*. Concave, *concavae*, &c.

Parts of a Valve.

The back, *dorsum*, of a Valve, is most frequently convex, and not seldom inscribed with a longitudinal furrow.

The belly, *venter*, is for the most part concave, and in many divided by a longitudinal septum.

The Margins, *marginæ*, are either inflected, or simple, and often thickened into a somewhat and prominent suture.

Obs. This suture in most instances simply connects the valves, but in some a kind of foreign body is interposed in the suture, thus the valves are discriminated by a net-work in *Lilium*, by a club-shaped bristle in *Pentapetes phanicea*; by a filiform rib in *Orchis*; and by the common receptacle of the seeds, or the outermost margin of the dissepiment in almost all the *Siliquosae*: hence in these, and in the *Orchides* the valves are not in mutual contact, but at maturity always leave a vestige of the interposed body, when they separate spontaneously.

C. INTERNAL FABRIC, *fabrica interna*, comprehends in general the Cells and Dissepiments; for of the seeds and their common receptacle, which often constitutes the greatest part of the inside of the fruit, we shall treat separately.

1. **CELLS, *loculamenta***, the chambers observed in the internal substance of Fruits; they are either destined to contain seeds, or are constantly empty, or filled with an useless matter.

The former are named true, *vera*, the latter spurious, *spuria*, cells. The spurious cells are fortuitous, or constant.

True cells in a fruit properly fecundated never are without a seed, their figure, number, situation, and proper coat, are to be carefully attended to.

The *Figure* of cells is generally definite or indefinite.

Obs. A cell is indefinite when the substance of the pericarp is so interposed between the seeds, that no distinct cavities are observed, and the rind or cuticle alone defines the internal area of the fruit, hence all fruits of this kind, from the want of a conspicuous septum, are accounted one-celled, as in *Grossularia*, &c.

The definite figure, adapted to one or more seeds, varies very much, but it will here only be generally observed; that in some instances the walls of the cells touch the seeds, and are at a very small distance, if any, from each other, these cells are named compressed (*compressa*), as in *Begonia*, *Dioscorea*, &c. In others the walls are remote from the seeds, and at a great distance from each other, these cells are named inflated (*inflata*), as in *Staphylea*, &c.: In some, again, the chambers are perfectly distinct, whilst in others they are found to communicate with each other, these fruits are named half two-, half three-celled, &c. &c. as in *Papaver*, *Juglans*, &c. &c. Finally, in some nothing but seeds are found in the cells, in others, a pulp is intermixed with the seeds, the latter, therefore, are called stuffed cells (*farcta loculamenta*); as in *Citrus*, &c.

The *Number* of Cells varies like that of the ovaries from the natural standard. Some are very often obliterated at maturity, and their number is not only different in different species, as in *Grewia*, *Mesembryanthemum*, &c., but is found to be different in the central, and other fruits of the same species, as in *Adoxa*, &c.

The true number of the cells is best determined from the immature fruit, with an attention to the rules and cautions given above. But in Berries which are destitute of an evident septum, and have more than one bonelet, a new difficulty arises, for by some they are referred to many-celled fruits, by Jacquin and others to one-celled fruits. The latter opinion is recommended by its simplicity, but it cannot be admitted without distinction, because evidently a Pyrene is one thing and a bony seed another; and because we cannot state seeds as two or more-celled without the utmost necessity. The solution of this difficulty depends upon the true notion of a Pyrene, which will be afterwards discussed.

The *Situation* of Cells is

a. Simple, *simplex*, when it arises from a single principle of co-ordination, and is

Opposite, *oppositus*, when two cells are conjoined by their sides, as in *Veronica* and all two-celled fruits.

Verticillate, *verticillatus*, when three or more cells are united with each other, and disposed in a single cir-

cle about a common centre, as in *Erica*, *Tulipa*, *Pyrola*, &c.

Parietal, *parietalis*, when the cells are very remote from the axis of the fruit, and are only attached to its walls, as in *Papaver*, many of the *Cucurbitaceæ*, &c.

Longitudinal, *longitudinalis*, when the cells are placed mutually upon each other, and are disposed in a simple series, according to the length of the whole fruit; as in *Raphanistrum*, &c.

Irregular, *irregularis*, when the cells are unequally subdivided, and do not converge towards the axis of the fruit, as in *Nymphaea lutea*, &c.

b. Compound, *compositus*, when it is composed of two simple situations, the dissepiments remaining entire and complete at maturity; and is

Doubly verticillate, *verticillatus duplex*, when one cell is placed behind another, and a double circle of small caverns is described in the same plane about the common centre, as in *Chamelæa*, *Sapindus*, *Nolana*, in the last the order of the cells is often triple.

Verticillato-longitudinal, *verticillatus & longitudinalis*, as in *Tribulus*, &c.

Parietali-longitudinal, *parietalis & longitudinalis*, as in *Momordica*, in many of the *Cucurbitaceæ*, &c.

Doubly-longitudinal, *longitudinalis duplex*, as in *Raphanus*, *Bunias*, *Erucago*, &c.

Two-simple, *ex duobus simplicibus*, the two differing in number and arrangement, as in *Punica*, the berry of which is divided above into seven or nine parietal, and below into three verticillate cells.

A Proper Coat is allotted to most cells, except in the stuffed fruits, and some one-seeded ones, in which the flesh is applied round the seeds.

Its consistence and thickness is very various, viz.

Very thin, *tenuissima*, as in the caspular fruits, where it is only distinguishable by its polished smoothness.

Arachnoid, *arachnoidea*, as in *Berberis*, *Capsicum*, &c.; and in some berries it is totally wanting.

Membranous, *membranacea*, in *Phœnix* and *Cydonea*.

Paper-like, *chartacea*, in *Areca*, *Pirus*.

Coriaceous, *coriacea*, in *Swietenia*.

Cartilaginous, *Cartilaginea*, in *Fraxinella*.

Horny, *cornea*, in *Mangifera*.

Woody, *lignosa*, in *Cerbera*.

Bony, *ossea*, in *Mespilus*.

Stony, *lapidea*, in *Prunus*, &c.

When this coat is very thick and hard, so as alone to make a distinct conceptacle, in which the seeds are inclosed, then it lays aside the name of a coat, and assumes that of *Putamen*, *Pyrene*, or *Bonelet* (*Ossiculum*).

PUTAMEN, a hard conceptacle of the seed, arising from the thickened proper coat of one, or more cells united together, which never separates into several closed parts, but either remains very entire till the germination of the seed, as in *Cornus*, &c.; or opens into regular valves equal in number to the cells, when there are several, as in *Bradleja* and *Emblica*. In Nuts and other fruits, the Putamen is often considered as a proper integument of the seed, but is manifestly different from the shell, *testa*, of the seed, first, because it frequently opens spontaneously into valves, or at least may be cut with a knife into regular parts; secondly, because it has dissepiments; and thirdly, because it is very often marked with a proper canal or groove, concealing the navel-cord of the seed, in the axis, or in either side; which qualities do not accord with the true shell of a seed.

PYRENES are nothing but partial putamens, or the bony coats of single cells, often again divided into partial chambers, entirely separated from the neighbouring ones which resemble them. They are easily distinguished from a putamen, even by their number alone, which is never less than two, but they are sometimes with so much difficulty distinguished from bony seeds, with which they agree very much in external form, that they are by many persons received into the number of these. To establish certain limits, as far as is possible betwixt Pyrenes and those seeds, we shall refer all bonelets to mere Pyrenes, first, which cohere in such a manner with the substance of the fruit by their outward roughish surface, that, when detached by force, they bring part of it along with them, as in *Mammea*; secondly, which, being placed in the middle of the fruit, are affixed to no evident receptacle, or navel-string placed without them, but grow to the flesh alone, as in *Aquifolium*. Thirdly, which transmit the navel-cord, so that the seed hangs free from its elongated end; as in *Erithalis*; fourthly, which are either subdivided into partial cavities, in each of which there is a single seed, as in *Grewia*; or which, within a single

cell hold more than one seed, as in *Mespilus*; fifthly, which contain a seed clothed with a coloured proper integument, or evident proper shell, as in *Cyminosma*; finally, sixthly, which are colourless, or at least tinged with no peculiar colour, as many true seeds are wont to be. By these marks we distinguish Pyrenes from bony seeds, and so provide against the difficulty arising from their presence in berries, with regard to the number of cells, so that we may with the Ancients consider berries as two, three, five, many-pyrenous, *di-tri-penta-poly-pyrenas*, and form our computation of the cells from the number of partial cavities taken together, thus in *Mammea* and *Aquifolium* the berry is four-pyrenous, four-celled, and in *Grewia*, two or four-pyrenous, eight-celled.

2. DISSEPIMENTS, *septa* s. *dissepimenta*, these often alone define the limits of the cells. They are in general formed of plates, *laminæ*, of different thickness, and consistence, which extending from one part of the fruit to another, sometimes terminate in the opposite side, sometimes in the axis, and sometimes even before they reach this; they differ from each other in the following circumstances:

a. *Cohæsion*.

a. Central, *centralia*, which cohere with the axis of the fruit, and separate spontaneously at maturity from the walls.

They are

Stable, *stabilia*, as in *Swietenia*, &c.; or

Moveable, *mobilia*, in *Plantago* and the two-celled *Banksia*.

b. Parietal, *parietalia*, which separate from the axis, and, at maturity, cohere with the valves, as in *Tulipa*, and innumerable others.

c. Copulative *copulativa*, which are never entirely detached, either from the axis, or parietes, as in *Campanula*, *Saxifraga*, most drupes, and all berries.

b. *Extensio^{po}*, or integrity.

a. Complete, *completa*, very entire, which form cavities closed on all sides, and not communicating with each other.

b. Incomplete, *incompleta*, which are deficient before the part opposite to them, the defect being either natural, as in *Androsæmum*, *Parnassia*, &c.; or accidental, as in *Saponaria*, *Silene*, &c. in which part of the dissepiments, at maturity, is indistinct, so that the cells seem incomplete.

c. Perforated *perforata*, which gape in the middle, as in *Saxifraga*, &c.

d. Parted, *partita*, which are detached, and fluctuating at the axis of the fruit, as in *Fasione*, *Asarum*, &c.

c. *Insertion.*

a. Ventral, *ventralia*, which are inserted longitudinally in the middle of the belly of the valves, as in *Iris*, &c.

b. Marginal, *marginalia*, which proceed from the inflected margins of the valves, and are always doubled (*duplicata*), or formed from the two contiguous plates, as in *Gloriosa*, *Capraria*, and all lobed fruits.

c. Intervalved, *intervalvia*, inserted in the common receptacle of the seeds, which is interposed between the valves; as in *Bignonia* and most of the *Siliculosæ*.

d. *Direction.*

Opposite, *opposita*, directly opposite to the valves, as in *Epi-lobium*, &c.

Verging to the sutures, *in ipsas suturas vergentia*; as in *Erica*, *Convolvulus*, &c.

e. *Position.*

Vertical, *verticalia*, which are the most common.

Transverse, *transversalia* s. *horizontalia*, which are chiefly observed in the *Leguminosæ*.

f. *Arrangement.*

Parallel, *parallela*, parallel to the valves, the breadth of the dissepiment being equal to the greatest breadth of the fruit, as in *Lunaria*, *Draba*, &c.

Contrary, *contraria*, contrary to the valves, the breadth being equal only to the less diameter of the fruit, as in *Thlaspi*, *Iberis*, &c.

I. PERICARP, *pericarpium*, a conceptacle, formed from the mature ovary alone, and containing the seeds in such a manner, that their proper form cannot be seen, is generally named a Pericarp.

Obs. A Pericarp is the special name of a Fruit, by which not only the determinate habit of the mature ovary is expressed, but its difference from a naked Seed is pointed out. This distinction between naked and covered Seeds is dictated by Art, for Nature, never producing a naked vegetable seed, has placed no certain limits between naked and covered seeds, but rather descends by such imperceptible steps from the thickest rind of some pericarps, to the thinnest cuticle of the naked seed as it is called, that all attempts at a solid distinction between those bodies are rendered fruitless. This is acknowledged by *Knaus* and others, and especially by *Vaillant*, who not only denies, that a seed can be called naked, in which a style is inserted; but does not even admit naked seeds in the *Verticillatæ* and *Stellatæ*, although in these the style is inserted in the receptacle. Nevertheless the contrary opinion has generally prevailed, and every mature ovary is ac-

counted a *naked seed*, first, which, immediately after the flowering is completed, assumes the appearance of a seed, and does not change it at maturity; secondly, of which the outer integument, not only very closely invests the nucleus, but even, at maturity, is never spontaneously detached from it, or opened into valves; thirdly, which has either no navel-cord, or one placed on the outside of it, as in the *Umbelliferae*; fourthly, which has a very simple and dry integument, (neither succulent, nor separating into more than one plate); and fifthly, which is not divided into more cavities than one, and which does not contain more kernels than one.—Ovaries of this kind are by most persons referred to naked seeds; and it must be confessed, that if they cannot physiologically be accounted naked, they may technologically and comparatively; and that in practice seeds of this kind are to be admitted, because the conformation, and external habit of those fruits cannot be expressed in a more compendious way, than by the simple appellation of a naked seed.

There are seven species of Pericarp, namely, Capsule, Nut, Coccum, Drupe, Berry, Legume, and Silique.

1. CAPSULE, *capsula*, a dry, membranous, coriaceous, or woody conceptacle, sometimes valveless, but more frequently opening into valves differing in number, situation, and form. It is by far the most common species of pericarp, and may be conveniently divided into the following kinds.

a. Utricle, *utriculus*, a one-celled, one-seeded capsule, often very thin and somewhat transparent, constantly valveless, and of an ovate or somewhat globular figure.

Obs. All naked seeds, strictly speaking, might be said to be inclosed in utricles, but, the term is here limited to those integuments of seeds, which, first, are separated from the seeds by slight rubbing between the fingers, as in *Chenopodium*, *Atriplex*, &c.; secondly, are manifestly accompanied by a navel-cord within their cavity, as in *Adonis*, *Thalictrum*, &c.; thirdly, are separated from the seed by an evident vacuity, as in *Illecebrum*, *Eleusine*, &c., and fourthly, which contain an inverted seed, so that the radicle of the embryo respects the style, as in *Callitriche*, *Zannichellia*, *Zostera*, &c., since the contrary situation is more usual in most naked seeds; as in the *Gramina*, *Compositae*, *Verticillatae*, and *Stellatae*.

b. Samara, *samara*, a coriaceous-membranous capsule, compressed, one, or two-celled, never opening spontaneously, and flattened into a leafy form near the sides or at the vertex, as in *Fraxinus*, *Ulmus*, *Betula*, &c.

c. Follicle, *folliculus*, often a geminate capsule, membranaceous-coriaceous, one-celled, one-valved; extended into a long form, opening on the inner side, and having either a distinct common receptacle of the seeds placed at the suture, as in *Cinchona*, &c.

or seeds affixed in a manifold series to the inflected margins of the follicle, as in *Veinca*.

Obs. The passage from a capsule to a legume seems to be made by follicles, for the capsules of *Helleborus* occupy the middle place between follicles and legumes.

d. Capsule strictly so called, *capsula strictius dicta*, this is one which cannot conveniently be referred to any of the preceding, and according to the various modification of its proper parts, it is

Corticated, *corticata*, when either the outer harder part is lined by an inner softer layer, as in *Swietenia*, &c; or when the outer spongy or cork-like part covers the proper crust of the capsule, which is much harder, and yet does not burst open elastically, as in *Triumfetta*, &c.

Berried, *baccata*, when there is within the rind, which opens at last into regular valves, a fleshy, pulpy, or fungous substance, through which the seeds are dispersed, as in *Zingiber*, &c.

Leguminose, *leguminosa*, having the form and fabric of a true legume, but having seeds very different in structure from those of a legume.

Siliquose, *siliquosa*, in form and structure resembling a true silique, but the seeds different.

Anomalous, *anomala*, not properly referrible, on account of its peculiar form, to any other kind of pericarp, as the fruit of *Neurada*, and *Grielum*.

Spurious, *spuria*, formed from the involucre of the fruit, not from the ovary alone, and, at maturity, opening like a true capsule into regular valves, as in *Castanea*, and *Fagus*.

Obs. The remaining general differences of capsules, arising from the combination of the parts, and from the number and situation of the valves and cells, are delivered above. The more special differences of figure and fabric are given in the description of the species.

2. NUT, *nux*, a hard conceptacle, either not opening at all, or if it do open, never separating into more than two valves.

Obs. It has an affinity on one hand with Capsules, and on the other with Drupes, and is even sometimes referred to naked seeds. It differs from capsules especially the woody, and coriaceous, in the absolute want of valves, and in the base often having a scraped or filed appearance to some distance. It differs from drupes in the manifest nakedness of the *putamen*, or if a rind be present, in the incomplete

opening at the apex. Finally, it differs from naked seeds, in the remarkable thickness of the putamen, the easy separation of it from the kernel, and the manifest umbilical vessels, placed within the cavity of the putamen, as in *Eriophorum*, many of the *Asperifolia*, &c.

a. INTEGUMENTS.

Naked, *nuda*, almost all nuts are naked or clothed with a scarcely discernible cuticle.

Smooth, *glabra*. Shining, *splendens*, &c.

Wrinkled, *rugosa*. Somewhat pubescent, *subpubescens*, &c.

Corticated, *corticata*, covered with a rind (*cortex*); the rind either membranous, and often extended into a wing or ribs, as in *Pinus*, *Cynoglossum*, &c.; or coriaceous and thick, as in *Juglans*; the latter are with difficulty distinguished from dry Drupes.

Involucrated, *involucrata*, nuts are more frequently furnished with an involucre than any other pericarps, as in *Castanea*, *Fagus*, *Taxus*, *Juniperus*, *Corylus*, *Quercus*, the integuments of which are usually by the incautious confounded with a capsule or berry.

b. CONSISTENCE.

Dry, *sicca*. Firm, *firma*. Hard, *dura*.

Coriaceous, *coriacea*, as in *Castanea*, &c.

Crustaceous, *crustacea*, as in many of the *Asperifolia*.

Cavernoso-coriaceous, *cavernoso-coriacea*, as in *Anacardium*, and *Acajuba*.

Bony, *ossea*, as in *Juglans*, *Corylus*, &c.

Stony, *lapidea*, as in *Myosotis*, &c.

c. OPENING.

Obs. There is no spontaneous opening before the germination of the seed, although many nuts may be divided easily by a knife; nor does the number of valves ever exceed two. *Juglans regia* alone has a manifest suture: *Trapa* alone opens with a hole at the vertex: But many open at the base, or at their insertion, with a round aperture, or chink, as in *Lycopsis*, *Buglossum*, &c.

d. INTERNAL FABRIC.

Very simple, *simplicissima*.

One-celled, *unilocularis*, almost all nuts are of this kind.

Two-celled, *bilocularis*, very few have two cells, as *Cerithe* and *Trapa*.

Three-celled, *trilocularis*, as *Fagus* and *Quercus*.

Half-Four-celled, *semiquadrilocularis*, as *Juglans*.
Six-celled, *sex-locularis*, as *Castanea*.

Obs. It is to be well remembered that dissepiments are only found in younger nuts, at maturity every appearance of them vanishes, except in *Cerintbe* and *Juglans*.—Finally, *spurious* nuts are formed from some involucre, which, at maturity assume the form and consistence of a true nut, but they are with ease distinguished from nuts, by an opening in the vertex, through which the style passes, as in *Carex*, *Xanthium*, &c.

3. COCCUM, *coccum*, a pericarp compounded of dry elastic conceptacles, or two or more partial cocculs.*

Obs. It has, on one hand, an affinity with the *Conjugate Capsules*, and on the other, with *Drupe*s, and it differs from both in its peculiar mode of opening; which is as follows, the partial cocculs first secede from the axis of the fruit, and each of them bursts, with great force, at the internal suture into two valves, which for the most part cohere at the base; but afterwards the sides of the valves are slightly twisted outwards, and at their ventral margin again open into a kind of curved chink, from whence proceeds on both sides a middle small segment, resembling the *tragus* of the human ear, as the chink does the *belix*. This mark, although it may appear of slight importance, is so constant, that it may be found not only in all the *Tithymals*, but in all the plants, which have pericarps lined within with an elastic plate, as *Fraxinella*, &c.: wherefore a *Coccum* may be easily distinguished by that mark, and cannot conveniently be joined with any other species of pericarp.

The difference of *Cocculs* are taken from the Rind, internal plate or layer, and the number of its parts.

- a. The Rind, *cortex*, appears to be entirely wanting in *Hura*. It is
Membranous, *membranaceus*, in *Tithymalus*, *Mercurialis*, &c.
Coriaceous, *coriaceus*, in *Buxus*, &c.
Fleshy, or. Fungous, *carnosus* s. *fungosus*, in *Embllica*, &c.

But of whatever consistence it be, it only covers the back of the Cocculs, and, at maturity, separates spontaneously into parts

* In the preface to the second volume, Gærtner informs us that *Coccum* should not be considered as a peculiar species of pericarp, but ought to be referred to the *elastic Capsules*. And in its place he substitutes *Angidion*, because by *MEDICUS* and *SCOPOLI* it is strictly named a pericarp; because it never opens spontaneously; because it comprehends the dry berries, and all those juiceless conceptacles of seeds, which can neither be referred conveniently to *Samaras*, nor true and regular Nuts, nor to any other species of pericarp; as the conceptacles of the seeds of *Sagittaria*, *Alisma*, *Neurada*, *Grielum*, the *Asperifoliae*, and some *Malvaceae*; these, as they never open, and are of a peculiar structure, he informs us, he shall hereafter name *Angidia*. It has been thought more proper to add these observations as a note, than to make an alteration in the text of the Introduction.

equal to them in number, but does not entirely fall off, except in *Emblica officinalis*.

- b. The Internal plate or layer is in almost all Chartaceo-cartilaginous, *chartacea-cartilaginea*.
Very much polished, *lævigatissima*, on its inner surface.
Bony, *ossea*, in *Hura*.
Stony, *lapidea*, in *Emblica* and *Bradleja*.
- c. The Number is rarely
Binary, *binarius*, and never less than two.
Ternary, *ternarius*, this is the most frequent, so that under certain restrictions the *Tricoccae* are deservedly considered as a natural order.

Obs. There are also *Tetracoccae*, as *Jatropha globosa*; *Pentacoccae* as *Diosma*, *Fraxinella*; *Hexacoccae* as *Bradleja*; *Hura* alone, as far as I know, is *Polycoccus*.—The number of Seeds in *Cocculis* is few, for in the greatest number of instances they are solitary; but two are found in *Buxus*, &c.; more are not found, for although in *Fraxinella* more ovules are present in each cell, yet all, except one or two, prove abortive.

4. DRUPE, *drupa*, a pericarp formed of a rind which never (very rarely) opens, and of a single putamen, closely cohering with the rind.

A. RIND, *cortex*, this scarcely ever opens spontaneously except in *Amygdalus*, and is in general soft, fibrous, or juiceless. Hence Drupes are

Berried, *baccatæ*, exactly resembling a true berry, except that they have only one bonelet (*ossiculum*) closely united with the rind, and that the bonelet is frequently divided into more cells than one. They are either

Pulpy, *pulposæ*, as in *Lantana*, *Cornus*, &c.; or
Fleshy, *carnosæ*, as in *Prunus*, &c.

Fibrous, *fibrosæ*, these, when they are recent, don't seem to differ from the *berried*; and when adult, do not appear to differ from the juiceless; but they do really differ from both, because their rind is in a great measure constructed of bony fibres, arising from the putamen, as in *Cocos*, &c.

Juiceless, *exsuccæ*, having an uniform, and dry rind, either membranous, coriaceous, or fungous, as in *Sparganium*, &c.

Obs. These drupes are with great difficulty distinguishable from nuts, and the limits, which are placed between the two, are commonly arbitrary. Nevertheless those Fruits are rather to be enumerated amongst

drupes, than nuts, which have a fungous and very thick rind, as in *Sparganium*, *Amygdalus*, &c.; or which have a thin, and membranous rind, but of an angular or winged figure, as in *Halesia*, *Cercodia*, &c.

B. PUTAMEN, *putamen*, differing principally in consistence, mode of opening, cells, and external figure.

a. Consistence.

Bony, *osseum*, or Stony, *lapideum*, hence Fruits of this kind are generally named Stone Fruits.

Crustaceous, *crustaceum*, brittle, as in *Styrax*, &c.

Coriaceous, *coriaceum*, as in *Hyphæne*.

Paper-like, *chartaceum*, as in *Pimpinella*.

Woody, *lignosum*, as in *Cerbera*.

Obs. The membranous putamen, ascribed to *Phoenix*, and the paper-like one attributed to *Areca*, are more properly considered as the mere internal coat of a one-celled berry.

b. Opening.

Obs. No opening takes place before the germination of the seed, although in some instances there are manifest appearances of valves, as in *Elaeocarpus*, &c., and although in others the putamen may be easily cut into two valves, as in *Prunus*, &c. In a few cases incomplete valves are found in the vertex of the putamen, so that, like some capsules, they seem to open with teeth, as in *Nitraria* and *Gaura*; and in a few others the putamen opens with a pore or foramen, as *Cocos*, &c.

c. Cells.

Obs. The cells are the same in drupes, as in nuts and capsules, except that they are never formed of coriaceous, or membranous dissepiments, except in *Nitraria*, *Pandanus*, and *Barringtonia*; wherefore in these they are constantly obliterated, at maturity; although it is not uncommon for the bony dissepiments to be wanting in the mature putamen, and for the natural number of the cells to be diminished, as frequently happens in *Olea*, *Cornus*, &c.—The number of the cells is different in different fruits. The Putamen is

One-celled, *uniloculare*, which is the most frequent.

Two-celled, *biloculare*. Three-celled, *triloculare*.

Four-celled, *quadriloculare*. Five-celled, *quinqueloculare*, these are much less frequent.

Many-celled, *multiloculare*, this is the most uncommon.

Guetarda affords an instance of a seven-celled, and *Hugonia* one of a ten-celled putamen.

d. Figure and External Fabric.

Obs. This is very various, and is to be well attended to, because many fruits may be easily distinguished from the first view of their putamen alone.

Roughish, *subscabrum*, a putamen is never perfectly smooth, like many bony seeds.

Furrowed, *exaratum*, or marked with evident eminences and depressions.

Striated, *striatum*, in a longitudinal direction, *longitudinaliter*.

Crested, or Winged with bony plates, *cristatum* s. *alatum laminis osseis*, as in *Tetragaunia*, &c.

Marked with spurious sutures, *suturis spuris distinctum*, as in *Cocos*, &c.

Wrinkled and Tubercled, *rugis & tuberculis scabratum*, as in *Amygdalus*, and *Zizyphus*.

Distinctly pitted, *scrobiculis discretis exsculptum*, as in *Nitraria*, &c.

Crinite with capillary fibres, *fibris capillaribus crinitum*, as in *Elæodendrum*, &c.

Curled with very rigid bristles and bony plates, *rigidissimis setis, & lamellis osseis crispatum*, as in *Spondias*, &c.

Muricated with tubercled ridges, *jugis tuberculatis muricatum*, as in *Elæocarpus*.

Digitate with mamillary processes, *processibus mammillaribus digitatum*, as in *Pandanus*.

Lobed with deep furrows *sulcis profundis in lobos partitum*, as in *Guettarda*.

Striato-reticulated, *striato-reticulatum*, having a wonderful plexus of anastomosing fibres, as in *Cerbera Odollam*, & *Manghas*.

Obs. With respect to the *internal structure* it will be sufficient to remark, that except the cavities of the true and spurious cells, most are perfectly solid within; but a few are found perforated according to their axis, as in *Canarium*, &c.; and others are inscribed at the side by the umbilical canal, as in *Prunus*, &c.: those, which are absolutely parted, are to be referred to *Pyrenes*.

5. BERRY, *bacca*, a softish pericarp, succulent, or juiceless, not opening into regular valves, and containing more than one bonelet growing firmly to it.—Berries are divided into *Granule*, *Pome*, *Gourd*, and *Berry* strictly so called.

a. GRANULE, *acinus*, a soft, succulent berry, somewhat transparent, constantly one-celled, and filled with one or more hard seeds, as in *Vitis*, *Rubus*, *Grossularia*, &c.

b. **POME**, *pomum*, a succulent or fleshy berry, two- or more-celled, the cells clothed within by a paper-like, or bony membrane, and placed in such a manner near the axis of the fruit, as either to cohere with, or to be separate from each other.

Obs. To this head are referred not only the fruits of *Pyrus*, or capsules clothed with a berry; but even the fruits of *Mespilus* and *Cratægus*, and all the pyreniferous berries, because they are conjoined by a manifest conformity of fabric, by one continuous bond of affinity, to each other; for *Sorbus*, *Sapota*, and *Cydonia*, which properly contain no capsule, or one that can scarcely be discerned, agree with *Pears*, by means of those glandules, like hailstones, which are dispersed through their pulp near the cells; and *Pears* would be true *Medlars* if their stony-bulb seceded into distinct conceptacles; and there such a similitude and affinity between the bonelets of *Cratægus*, and the pyrenes of other berries, that they are not usually even distinguished by different names. Since, therefore, all these fruits are allied to each other by the structure of their parts, especially the cells, they are all, with reason, comprehended under the more general title of *Pome*.—It is, moreover, worthy of observation, that pomes hold a middle place on one hand, between capsules and berries, and on the other between these and drupes; and that in some instances their soft or fleshy substance is so changed at maturity, that it sometimes separates into distinct parts with its pyrenes, as in *Messerschmidia* and various *Verbenaceæ*; and sometimes only deliquesces at the vertex, when the naked bonelets project above it, as in some species of *Cratægus* and *Mespilus*.

c. **GOURD**, *pepo*, a fleshy berry, having the cells remote from its axis, and so placed near the circumference of the fruit, that the seeds are even fixed to the parietes.

Obs. Gourd in common language denotes the large fruit of *Cucurbita*.—It can by no means be associated with pome, for as a *Legume* and *Siliqua*, on account of the insertion of their seeds, are rightly separated from capsules, so Gourds deserve to be distinguished not only from pomes, but from all other berries, on account of the singular situation of the parts peculiar to them. They occur more frequently in the *Cucurbitaceæ*, than in any other plants.

Solid, *solidus*, full of flesh, and containing one or more seeds in each cell, as in *Cucumis*, *Bryonia*, *Stratiotes*, &c.

Hollow, *cavus*, having a large cavity within, either empty, or containing a mere lymph; and having the seeds single in distinct membranous, or fleshy cells, and affixed in rows to the walls, as in *Momordica* *Charantia*, and *Granadilla*.

d. **BERRY**, *bacca*, strictly so called, embraces all the remaining species, which differ from the preceding.

Corticated, *corticata*, these are generally so hard, that they might be accounted capsules, if they were not constantly valveless, and did not contain a copious medulla, as in *Sagus*, *Cacao*, &c.

Juiceless, *exsucca*, wholly membranous or coriaceous.

Obs. This differs from capsule principally by these marks; First, It never opens, as in *Caryophyllus*, &c; Secondly, It has often a coloured external surface, as in *Cucubalus*, *Hedera*, &c: Thirdly, Its figure is exactly spherical, as in *Trientalis*, &c: Fourthly, It is manifestly fleshy before its full maturity, at least it is not always membranous, as in *Sicyos*, and various *Stellatæ*. On this account *Bulbine*, *Nerada*, &c. are to be removed from Berries, although they never open.

Spurious, *spuria*, which is formed of a fleshy integument, spread over the ovary at maturity, and resembles a true berry, as in *Juniperus*, *Taxus*, &c.

Obs. When the mere receptacle is fleshy, as in *Fragaria*, *Ficus* and *Acajuba*, it ought to be called a *berried* receptacle, not a berry. The *Consistence* of the Pulp is generally soft; and particularly is sometimes fluid and almost watery, in *Anabasis*; glutinous in *Viscum*; mucilaginous in *Nymphaea*; fleshy in *Phanix*; fungous in *Mandragora*; and intermixed with callous grains, or harder fibres, in *Sapota* and *Cyminosma*.

The *Structure* of the Pulp is, First, *uniform*, or somewhat homogeneous, as in most cases; Secondly, *vesicular*, or consisting of shut cells, filled with a peculiar substance, as in *Citrus*, *Cucumis*, and *Mangostana*; and Thirdly, *arilliform*, when the pulp seems to cohere in no part with the walls of the cells, but can be taken out of their cavity like a peculiar pulpy follicle, containing one or two seeds in separate cells, as in *Limonia*, *Bryonia laciniata*, and sometimes in *Jasminum*.

External changes, except of colour, rarely occur in mature berries, since it is one of their chief qualities not to open. However there are some, which deviate from this rule; for example, the Berry of *Myristica*, at maturity, opens with a longitudinal chink in one of its sides, the fruit of *Xylopia* is generally divided by a similar fissure in the vertex. Others burst elastically, or at least spontaneously into irregular segments, and discharge their mature seeds; as in *Charantia*, and *Punica*; others gape by throwing off the lid or cover of the vertex, as in *Momordica operculata*; others open with a hole in the apex, as in *Berberis*, and finally, others open with a pore in the base, as in *Elaterium*.

6. LEGUME, *legumen*, a membranous or coriaceous conceptacle, generally oblong, with longitudinal sutures, having seeds affixed to the margins of the valves *on one side only*.

a. FIGURE.

Oblong, *oblongum*, this is the most common.

Obs. It terminates above in a short style, placed somewhat out of the axis, and below is contracted into a peduncle, is slightly compressed, and straightish on one side, and rather more gibbous on the other.

Lanceolate, *lanceolatum*. Circular, *orbiculatum*.
Crescent-shaped, *lunatum*. Rhomboidal, *rhomboides*,
&c. &c.

Obs. Some genera have a certain definite form of a Legume, thus *Indigofera* has a four-cornered one; *Medicago*, a crescent-shaped, or cochleate one, &c.

b. CONSISTENCE and FABRIC.

Membranous, *membranaceum*.

Coriaceous, *coriaceum*.

Obs. These are the most general, but a few occur of a different kind.

Berried, *baccatum*, filled with a softer, pulpy, fleshy, or fungous substance, as in *Tamarindus*, *Cassia Fistula*, &c.

Corticated, *corticatum*, both the inner and outer substance hard, and coriaceous, and separating easily from each other, thus *Onobrychis* is corticated with a sieve-like muricated integument, and *Hedysarum coronarium* with a fungous crust.

Drupaceous, *drupaceum*, having a bony, or cork-like putamen, under a coriaceous and valveless rind, as in *Pterocarpus*, &c.

c. OPENING.

Two-valved, *bivalve*. This is the most frequent

Three-valved, *trivalve*, as in *Moringa*.

Four-valved, *quadrivalve*, as in *Acacia quadrivalvis*.

Valved on both sides, *utrinque valvatum*, as in *Bisserrula*.

Obs. One-valved legumes are very uncommon except spurious ones, and Three-valved, &c. are still more uncommon.

Jointed, *articulatum*, this kind of opening is peculiar to legumes, and not very frequent in them even. It occurs in *Hedysarum*, &c. The joints of *Mimosa* are not uncommonly two-valved.

d. CELLS.

One-celled, *uniloculare*. Conjugate, *conjugatum*.

More, or many-celled, *pluriloculare* s. *multiloculare*.
having more than one cell, or many cells.—The cells are

Vertical, *verticalia*, or parallel to the axis, as in *Astragalus*, *Trifolium*, *Biserrula*, &c.

Transverse, *transversalia*, placed mutually over each other, from two, as in *Hedysarum*, to eighty or more, as in *Cassia*.

Obs. Vertical cells are very rare and are only found in the one-celled or conjugate legumes.—The *dissepiments* are often indistinct at maturity, so that a legume may appear one-celled, which is really many-celled, as in *Dolichos*, *Lupinus*, *Phaseolus*, &c.; wherefore in these, if we wish to be certain respecting the number of the cells, the immature ovaries ought to be inspected: But in most instances, it is of little importance to know the exact number, it is sufficient in general to know whether a legume is one-celled, or more-celled, because the number varies much even in the same species.

e. SPURIOUS, *spurium*.

Obs. Spurious Legumes are capsules, as has been before observed, which, with respect to their external figure, insertion of the seeds, and opening, have a very near affinity with true legumes, so that they cannot be properly distinguished except from the structure of the seeds. The seed of a true legume always contains an embryo, the cotyledons of which fill the whole cavity of the shell, or at least are equal to it in length and breadth, if not in thickness, and the radicle of which, except in the family of *Cassias*, is always curved, and retorted towards the chink of the cotyledons: Whenever therefore in a supposed legume the seed is found to contain a roundish embryo, or one generally smaller than the cavity of the shell of the seed, and surrounded by an albumen many times larger than itself, that ought not to be called a true legume, but a *leguminous Capsule*, as the Fruit of *Helleborus*, *Aquilegia*, &c.

7. SILIQUE, *siliqua*, a dry conceptacle, more frequently two-valved, having seeds fixed to a filiform receptacle, interposed between the margins of the valves, *on both sides*.

a. FIGURE.

Narrow and Long, *angusta* & *in longum protensa*.
Roundish, *subrotunda*. Short, *brevis*.

Obs. These Pericarps are commonly divided into *Siliques* strictly so called, which are longer; and *Silicles*, which are shorter and smaller.—Their proper figure varies very much, and is most frequently compressed either directly or transversely, whence the *Valves* are more frequently flat, or boat-shaped in these pericarps than in any others.

b. NUMBER.

Single, or Simple, *singula* s. *simplices*.

Double, *geminata* s. *conjugata*, or formed of two partial conceptacles, as in *Iberis*, *Biscutella*, *Coronopus*, &c.

Obs. *Siliques* strictly so called, are always single and simple; but double or conjugate *Silicles* are not unfrequently observed.

c. SUBSTANCE.

Membranous, *membranacea*.

Coriaceous, *coriacea*.

Drupaceous, *drupacea*, having a bony two or four-celled putamen, under a membranous, or fungous integument, as in *Bunias*.

Berried, *baccata*, having more than one separate bonelet, as in *Raphanistrum*; or having a spongy, or coriaceous rind which does not open, as in *Myagrū Crambe*, *Raphanum sativum*.

d. OPENING.

Two-valved, *bivalvis*.

Somewhat jointed, *subarticulata*, &c.

Obs. Almost all the *Siliques*, strictly so called, are two-valved, and most of the *Silicles*. The somewhat jointed ones are more rare, and occur in *Cakile*, *Raphanistrum*, &c. A mixed mode of opening is observed in *Erucaria*, the silique of which is jointed above, two-valved below. The berried, drupaceous, and many geminate siliques never open; and of the others *Clypeola*, *Peltaria*, *Rapistrum*, do not open.

e. CELLS, these are

Vertical, *verticalia*, which are the most common.

Transverse, *transversalia*, which are much more rare.

Compound, *composita*, compounded of the two preceding, which are the most uncommon.

Obs. We have instances of pure vertical cells in the one-celled siliques of *Clypeola*, *Isatis*, &c., and in the two-celled ones of *Vella*, *Cardamine*, and many others. The silicles of *Bunias orientalis*, and *Crambe hispanica* are composed of two pure transverse cells, and the *Siliques* of *Raphanus*, *Raphanistrum* and *Bunias Erucago* are composed of more than two, placed in a single or double series. Finally we observe a mixed situation from true and spurious cells in the silicles of *Cakile* and *Myagrū perfoliatum*, and in the silique of *Erucaria* the uppermost cells are vertical and spurious; the two or three intermediate ones are true and longitudinal; and the two lowest are true and vertical cells, so that from this structure alone *Erucaria* may be easily distinguished from all known plants.

f. SPURIOUS, *spuria*, exactly resembling a Silique in form and structure, but having seeds of a very different fabric.

Obs. Every seed of a true silique is constantly exalbuminous, and contains an embryo exactly answering to the cavity of the shell in magnitude, and furnished with a radicle accumbent, or lying upon the sides of the cotyledons. On the contrary, the seed of a spurious silique

is albuminous in all except in *Bignonia*, and its embryo is for the most part very minute, or at least is never found so much curved that it can be said to be conduplicate or convolute. These spurious siliques, which are found in *Bignonia*, *Chelidonium*, *Glaucium*, &c., are named *siliquose* capsules, and ought to be distinguished from the *raphispermous* capsules of *Gentiana*, *Swertia*, &c., which resemble them, because in these there is no receptacle of the seeds interposed between the valves, as there is in the former. However, lest this distinction should appear too minute, it may be neglected, and both these kinds of capsules may be named generally *siliquose*.

II. RECEPTACLE, *receptaculum*, affording a base and nutriment to the parts of Fructification.

Obs. It is distinguished into the *Receptacle of the Fruit*, and the *Receptacle of the Seed*, although both may be one and the same.

1. The RECEPTACLE OF THE FRUIT, *Receptaculum fructus*, is the part which connects the pericarp, or naked seed with the plant, and serves as a support to them.

Obs. This Receptacle is either proper to a single fruit, or common to many. In the former case it is scarcely considered as a receptacle, but is accounted a mere peduncle of the fruit, except when, at maturity, it becomes very conspicuous from its length or thickness, as in *Acajuba*, &c., the peduncle of which is converted into a berry, and as in *Typha*, &c., the peduncle of which is remarkably elongated, whence pericarps of this kind are named *pedicelled* (*pedicellata*). In the latter case, the place upon which several fruits stand, and which is distinct from the other parts, and often has a peculiar form, is more properly called the receptacle. This place is either within, or beneath the flower, and hence the Common Receptacle is either superior or inferior.

a. SUPERIOR, *superum*, when the common receptacle is placed within the flower.

Narrow, *angustum*, in some it is so depressed as scarcely to deserve notice; viz. in *Thalictrum*, *Potamogeton*, &c.

Inconspicuous, *inconspicuum*, when the mere bottom of the calyx supplies its place, as in many of the *Verticillatæ*, *Asperifoliæ*, &c.

None, *nullum*, it is considered as wanting, when its substance, at maturity, is dried and disappears, as in *Limeum*, and most of the *Stellatæ*.

Obs. In the following cases, however, the receptacle is very conspicuous, and either is formed from the Style, as in *Geranium*, many of the *Malvaceæ*, *Tricoccæ*, and *Asperifoliæ*, or owes its origin and form to the thalamus of the flower, as in *Comarum*, &c.

Globular and Juiceless, *globosum* & *exsuccum*, as in *Sagittaria* and *Comarum*.

Somewhat Ovate and Fleshy, *subovatum*, & *carnosum*, as in *Fragaria*.

Cylindrical and Villous, *cylindricum ac villosum*, in *Geum* and *Anemone*.

Columnar-acuminate, *tereti-acuminatum*, in *Magnolia* and *Liriodendrum*.

Honey-combed, *favosum*, as in *Nelumba*.

- b. INFERIOR, *inferum*, when the common receptacle lies under the naked ovaries, or is placed beneath the proper calyx of the flower.

Obs. This, strictly speaking, occurs in all aggregate fruits, but is only acknowledged as a true receptacle in those fruits, in which it is abundantly distinct in its form, and structure, from a branch, or simple shoot of the mother plant; hence there is no common receptacle in the various species of *Banksia*, &c., but the fruits are simply aggregate about the branch. But receptacles of this kind are most frequent in Compound Flowers, and because all the rest are formed according to these, their figure, fabric, and accessory parts will be here carefully attended to.

a. *Figure.*

Concave, *concavum*, as in *Crepis alpina*; this is very rare.

Flat, *planum*, as in *Lapsana*, *Sonchus*, &c.

Slightly convex, *leviter convexum*, as in *Helenia*, &c.

Globular, *globosa*, as in *Sphæranthus*, &c.

Conical, *conicum*, as in *Bellis*, &c.

Oblong, or Ovato-cylindrical, *oblongum s. ovato-cylindricum*, as in *Chamæmelum*, &c.

Obs. The flattish receptacles, at maturity, more commonly become somewhat globular, and cushion-like, as in *Leontodon*, *Tragopogon*, *Petasites*, *Jacobæa*, &c.

b. *Surface.*

Obs. The inner structure is generally spongy, and either entirely solid, or more rarely hollow, and, as it were, inflated, as in *Sphæranthus*, &c.

- a. Puncticulate, *puncticulatum*, marked with very minute, and scarcely perceptible dots, in other respects perfectly smooth, as in *Matricaria*, *Lactuca*, &c. &c.
- Scrobiculate, *scrobiculatum*, having larger roundish pores, smooth at their margin, as in *Leontodon*, *Senecio*, &c.
- Alveolate or Honey-combed, *alveolatum s. favosum*, separated into membranous angular cells, variously crenulate, or ciliate at the edge, as in *Onopordum*, &c.

Obs. These sockets (*alveoli*) often cannot be discerned without a magnifying glass, and generally are so much obliterated at maturity, that their cavity is filled by a mamillary tubercle, as in *Hieracium*, &c.

Various, *varium*, viz. scrobiculate in the circumference, alveolate in the disk, as in *Baccharis*; or scrobiculate in the circumference, and villous in the centre, as in *Gorteria*, *Osteospermum*, &c.

β. Tubercled, *tuberculatum*, rough with small distinct or contiguous tubercles, as in *Lapsana*, *Artemisia*, *Prenanthes*, &c.

Prickly, *aculeatum* s. *apiculatum*, set with soft distant thorns or prickles, to be distinguished carefully from chaffs, as in *Cichorium*, &c.; or with pungent ones, as in *Gundelia*.

γ. Naked, *nudum*, having neither conspicuous hairs, bristles, nor chaffs.

δ. Villous and Tomentous, *villosum* & *tomentosum*, covered with small hairs arising from the substance of the receptacle, as in *Arnica*, *Absinthium*, &c.

Bristly, *setosum*, rough with numerous hairs and bristles, proceeding from the ciliate margin of the sockets, as in *Arctotis*, and various *Capitata*.

Chaffy, *paleaceum*, furnished with scales, leaflets, &c. (*paleæ*), interposed between the ovaries.

Chaffs, *paleæ*, small membranous or setaceous leaflets, often formed from the leaflets of the common involucre changed gradually into narrower and smaller skins (*philyræ*) as in *Coreopsis*, &c., or having a proper origin from the receptacle.

αα. Oblong, *oblongæ*, or Linear-acuminate, *linear-acuminatæ*, as in *Achillea*, &c.

Setaceous, *setacæ*, as in *Cyanus*, &c.

Keeled, *carinata*, and ending in a pungent awn, as in *Anthemis*, &c.

Ciliato-lacerated at the top, *apice ciliato-laceræ*, as in *Carlina*, &c.

ββ. Distinct, *discretæ*, and applied to each other mutually in an imbricated manner, as in *Zinnia*, &c. &c.

Joined, *junctæ*, two or more joined together so as to form a deep socket, in which the ovary lies secluded from the rest, as in *Carlina*, &c.—Hence it may be suspected that all the membranaceo-alveolate receptacles are formed from a similar connection of the chaffs.

Obs. With respect to the *situation* of the *chaffs*, it is most usual to find the whole receptacle so covered with them, that between each there is only sufficient room for a single floret, or ovary. But they are also found; first, occupying the whole receptacle except its vertex, where they leave sufficient space for several barren florets, as in *Evax* (*Filago* Lin.); secondly, covering the ray, but leaving the disk naked for a considerable breadth, as in *Anaxeton*; thirdly, dividing the common receptacle into several partial ones, being disposed like peculiar involucrets about one or more ovaries, as in *Echinopus*, &c.; fourthly, penetrating deeply the substance of the common receptacle, and dividing it into various lobes, as in *Gundelia*.

A similar modification of the common receptacle also takes place in other plants, as in *Eryngium*; *Platanus*, *Sagittaria*, the *Dipsacæ*, &c. And there are a few receptacles, which cannot be referred to any of the above-mentioned: For example, that of Liquidambar is a fungous, deeply alveolate globe, with a double capsule sticking in each of the cells: In *Opercularia* the receptacle is inversely pyramidal, and is placed midway between the flowers and ovaries, an unheard of circumstance: The filiform bifid receptacle, placed in the axis of the fruits, between the double capsules of *Acer*, &c., and between all the seeds almost of the *Umbellifera*, also recedes from the accustomed form, &c.

2. RECEPTACLE OF THE SEED, *Receptaculum seminis*. In the naked seeds, this is not thought to be different from the receptacle of the fruit. But the receptacle of a covered seed is always placed within the pericarp, and is

a. COMMON, *commune*, having more than one seed affixed to it.

Obs. Any internal region of a pericarp, to which more than one seed is attached, is *generally* called a Common Receptacle of the seed, but *specially* it is a body distinct from the proper substance of the fruit, and extended between the cells, and is a part of very great importance, in the disquisition of fruits.

a. *Consistence*.

Spongy, or Fungous, *spongiosum* aut *fungosum*, as in *Stramonium*, *Hyoscyamus*, &c.;

Fleshy, *carnosum*, as in *Vacciniūm*, &c.

Coriaceous, *coriaceum*, or membranous, *membranaceum*, as in *Martynia*, *Papaver*, &c.

Fibrous, *fibrosum*, as in *Portulaca* and the *Siliquosæ*.

Cork-like, *suberosum*, or Woody, *lignosum*, as in *Swietenia*, &c.

b. *Surface*.

Puncticulate, *puncticulatum*, Scrobiculate, *scrobiculatum*, Alveolate, *alveolatum*, as in *Anagallis*, *Centunculus*, &c. See Page 124.

Tubercled, *tuberculatum*, as in *Stramonium*.

Hirsute, *hirsutum*, as in *Cucubalus*, *Silene*, *Canna*.

c. Form.

Obs. This is very constant, but sometimes is scarcely distinct from the neighbouring parts, thus the receptacles, which are inscribed on the walls of the valves, or the internal margin of the dissepiments, differ little or nothing from the surrounding parts, and may be said to be of an indefinite form.

Membranaceo-compressed, *membranaceo-compressum*, as in *Papaver*, &c.

Filiform, *filiforme*, as in *Portulaca*, the *Siliculosæ*, &c.

Subulate, *subulatum*, as in *Dianthus*, &c.

Cylindrical, *cylindricum*, as in *Lychnis*, &c.

Three-, or Five-cornered, *tri- s. 5-gonum*, as in *Ixia*, &c.

Somewhat globular, *subglobosum*, as in *Lysimachia*, &c.

Half-ovate, *dimidiato-ovatum*, as in *Hyoscyamus*, &c.

d. Connexion.

Free, *liberum*, cohering with the fruit at one extremity only, and detached on every side.

Columnar, *columnare*.

Erect, *erectum*, arising from the base of the capsule, and extending upwards, as in *Primula*, &c.

Pendulous, *pendulum*, having a contrary origin and situation to the former, as in *Fraxinus*, *Arbutus*, &c.—This is very rare.

Adnate, *adnatum*, connected throughout its whole length with the fruit.

Sessile, *sessile*, closely adhering on all sides to the axis or parietes of the fruit, as in *Plantago*, *Solanum*, &c.

Stipitate, *stipitatum*, inserted in the pericarp by means of an interposed lamina or plate, so as to be at some distance from its axis or walls, and often covered with seeds on both surfaces, as in *Stramonium*, *Parnassia*, *Digitalis*, &c.

e. Number.

a. In one-celled Pericarps.

Single, *unicum*.

Two together, *gemina*, as in *Grossularia*, *Chironia*, &c.

Three together, *terna*, as in *Androsæmum*, *Helianthemum*, &c.

Four together, *quaterna*, and Five together, *quina*, as in *Parnassia*, &c.

Numerous, *numerosa*, as in *Papaver*.

b. In Pericarps with more cells than one.

Obs. The number of receptacles of the seed, in pericarps having more than one cell, very constantly corresponds with the number of the cells, so that there is no example of the contrary. Even in the one-celled pericarps, more than one *free* receptacle are never found, except in *Portulaca pilosa*, which has five distinct filiform branched receptacles within the cavity of the fruit. But the number of *adnate* receptacles found in one-celled fruits is very frequently greater than one, as in the instances above mentioned.

f. Situation.

Central, *centrale*, either constituting the axis of the fruit, as in *Rhododendrum*, &c., or having a connection with the axis, as in *Ophiorrhiza*, &c., or formed from the central or internal margin only of the dissepiments, provided they reach the axis, as in *Tulipa*, &c.

Septal, *septale*, when both sides of the dissepiments are beset with seeds, and the dorsal parietes of the fruit are entirely naked, as in *Papaver*, *Nepenthe*, &c.

Lateral, *laterale*, when the seeds are inserted in the sides of the fruit.

Unilateral, *unilaterale*, when the seeds are inserted in one side only, as in *Actæa*, the true and spurious *Leguminosæ*, &c.

Bilateral, *bilaterale*, supporting the seeds on two opposite sides, as in *Chelidonium*, and most of the true *Siliquosæ*.

Parietal, *parietale*, when the seeds are affixed in three or more distinct series, or even all round, to the internal walls (*parietes*) of the fruit, as in *Drosera*, *Gentiana*, &c. &c.

Vague, *vagum*, not referrible to any of the preceding, as in *Portulaca*; or when the pulp of the pericarp serves as a common receptacle to the seeds, which have no uniform and definite situation, as in *Muntingia*, *Nymphaea*, &c.

b. PROPER, *proprium*, the proper receptacle of the seed supports only a single seed.

Obs. By means of this the seed is connected with the mother-plant, and derives its nourishment.—It is much more simple than the common receptacle, and has no definite form, except when the common receptacle is wanting. It arises often from the receptacle of the fruit, or from the pericarp itself.

a. Form.

Filiform *filiforme*, in this case it is named the navel-cord (*funiculus umbilicalis*.)

Obs. The Navel-cord is seldom wholly destroyed, and sometimes increases as the fruit approaches maturity. This cord is generally shorter than the seed, as in almost all the *Leguminosæ*; sometimes of equal length, as in *Grossularia*, *Lunaria*, *Draba*, &c.; and is sometimes much longer, as in *Crambe*, &c. The *Form* of the cord is generally that of a slender thread; however, in the *Leguminosæ*, &c. it resembles a fungous peduncle; in *Phoenix* and *Lontarus* it deserves the name of a cord, because it is composed of several fibres, and is thicker than a quill. It is often simple, but in a few examples it is divided into two branches at the extremity, nearest to the seed (scarcely ever into more, except in *Fraxinus*), of which sometimes one only bears a seed, and the other serves as a fulcre, as in some species of *Vicia* and *Lathyrus*; sometimes both have a proper seed affixed to them, as in *Liriodendrum*; two seeds very rarely hang from one individual cord, as in *Magnolia*, &c. The *Course* of the cord in drupaceous, and nucamentaceous fruits, and in some bony seeds, is remarkable, since in these it generally proceeds not in the nearest way to its seed, but running in a proper furrow inscribed on these bony integuments, it passes to the remotest, or at least to the middle region of the seed, and is there at length connected with it, as in *Prunus*, &c. In various soft seeds likewise, it is concealed by their coat, and runs a long way betwixt their membranes, and comes by windings to the point of insertion, as in *Liriodendrum*, *Swietenia*, &c.: Not to mention the setaceous receptacle of the *Umbelliferae*, which, though concealed, extends from the base to the apex of the seeds, and seems to be nothing more than a twin navel-cord.—The *Insertion* of the cord admits of the following variations, on account of its two extremities, being fixed at one end to the

1. base of the fruit, and at the other to the
 - a. base or lower extremity of the seed, as in *Eriophorum*, *Carex*, &c.
 - b. vertex, or upper extremity of the seed, as in *Prunus*, &c.
 - c. middle ventral portion, as in *Symphytum*, &c.
 - d. middle dorsal part, in such a manner, that the cord ascends above the vertex of the seed, and being afterwards reflected, enters the hole in the back of the seed, as in *Vitis*!
2. vertex of the fruit; and at the other to the
 - a. upper extremity of the seed, as in *Isatis*, *Adonis*, &c.
 - b. lower extremity, as in *Statice*, &c.
3. axis of the fruit, and at the other to the
 - a. vertex of the seed, as in *Guaiacum*, *Tricocca*, &c.
 - b. base of the seed, as in *Pyrus*, *Mespilus*, &c.
 - c. inner horizontal extremity, as in *Tulipa*, &c.
 - d. middle part, as in the *Malvaceæ*, &c.
4. walls of the fruit, and at the other to the
 - a. acuminate part of the seed, as in the *Cucurbitaceæ*, &c.
 - b. obtuse part, as in *Grossularia*.
 - c. middle of the side between the two extremities, as in various *Leguminosæ*, and *Siliquosæ*.

By these bonds the seed coheres intimately with its pericarp, till, the nutritious vessels being closed at maturity, the navel-cord be broken, and the seeds, being set at liberty, are scattered on all sides, and draw their future nourishment from the bosom of the earth.

Scar-like, or Nipple-like, *cicatriculæ* s. *papillæ* forma, these are scarcely ever attended to, because they are inconspicuous, and often entirely obliterated, at maturity.

III. MATURE SEED, *semen maturum*.

Obs. A Seed is known to be ripe not from its saturated colour, not from its sinking in water, nor from its hardness, but from the nucleus being rendered solid, filling very exactly the cavity of its shell, and having no void space within itself, when in this state it is fit for for germinating.

1. *Parts and Regions*.

A. NAVEL, *umbilicus*.

- a. EXTERNAL, *externus*, named *Fenestra* by Malpighi, and *Hilum* by Linnæus, is the aperture of the seed, through which the nutritious vessels pass to its inner cavity, and which, at maturity, is stopped, yet in such a manner, that an easy entrance is allowed to water, and the moisture of the earth.

Obs. The external umbilicus deserves great attention, not only on account of its various form, but because it alone affords a fixed point, from which the external surface of the seed can be distributed into certain regions, and the situation of the internal parts properly determined.

- a. Superficial, *superficialis*. impressed on the surface of the shell, and having the appearance of a small hole, pore, or scar, as in *Campanula*, *Digitalis*, &c.

Obs. This is the most frequent, and the most simple; but it is as it were truncated or surrounded by the scraped base of the seed, in some instances, as in *Staphylæa*, &c.; and in others again it is found marked with a spot of a definite form, and generally of a snowy colour, as with a *cordate* scar in *Areca*, &c., a *linear* one in *Fraxinella*, and a *two-forked* one in *Dracocephalum*, and various other *Verticillatæ*.

Concave, *concavus*, representing a cup or border affixed externally to the seed, as in *Helleborus*, &c.; or a deep funnel-shaped canal, clothed within with the crust of the shell, as in *Zingiber*, &c. and especially in *Commelina*, the whole embryo of which is very singularly placed within the crustaceous canal of the umbilicus.

Obs. The larger apertures of the seeds of *Menispermum* and most of the *Stellatae*, are by no means to be referred hither, for although these seeds are by some strictly called *umbilicate*, yet those holes are not true navels, because they do not lead into the internal cavity of the shell, but into the arch of a bullate, or meniscate seed. And also, properly speaking, the apertures of the nuts, in some of the *Asperifoliae*, do not belong to this place, because they are inscribed in the pericarp not in the shell of the seed; however in these they may be accounted navels, since they manifestly transmit the navel-cords, and are by all placed in the number of navels.

Convex, *convexus*, either beaked and formed of the substance of the shell, as in *Senna*, *Melampyrum*, &c.; or fungous, and consisting of a tubercle of a different, and for the most part spongy and whitish substance, as in *Tithymalus*, *Mercurialis*, &c.

Appendaged, *appendiculatus*, when parts of a peculiar consistence or figure are affixed to the seed near it: Thus in *Polygala* a four-toothed coronet is placed upon the umbilicus; in *Genista*, *Ulex*, and *Spartium* it is surrounded with a fungous, cordate, or two-lobed scale; in *Chelidonium* it is decorated with a sickle-shaped, toothed, and pellucid glandular crest; in *Bocconia*, &c. it is clothed with a glandular integument: not to mention the rest of the arilled seeds, in all which the arils very constantly cohere with the shell near the navel, and no where else. Moreover, in the *Leguminosae*, a little below the *fenestra*, sometimes two tubercles or callous points, are observed, as in *Phaseolus*, sometimes only one, as in *Lathyrus*, &c., and in others bands (*fasciae*) are found, which take their origin from the navel, and sometimes extend to the vertex, and sometimes surround the whole seed, as in *Dolichos urens*, &c.

b. Obverse, *obversus*, when the radicle of the embryo respects the aperture of the navel, as in *Compositae*.

Opposite, *oppositus*, when the radicle of the embryo is exactly opposite to the navel, as in *Colchicum*.

Contrary, *contrarius*, when the umbilicus is placed opposite to the middle of the scape of the embryo, as in *Plantago*.

Devious, *devius*, when the umbilicus is placed in the axis, and the embryo horizontally at the circumference of the seed, as in *Phoenix*.

b. INTERNAL, *internus*, the internal umbilicus is the point,

in which the navel-cord or bundle of the vessels, conveying the nourishment, is inserted in the proper membrane of the kernel.

Obs. This point often coincides with the external navel; but frequently, also, the navel-cord, after it has entered the shell of the seed, passes further, and terminates, for the most part, in the opposite extremity of the kernel, and there forms the internal Umbilicus, which appearing sometimes like a coloured areola, sometimes like a small callous tubercle, has the proper name of *Chalaza*. In many seeds this fabric does not come into view till the shell be removed, but in not a few the vestiges of it appear even in the external surface of the seed, for we observe a band, furrow, or rib, arising from the external navel, running to the opposite region of the seed, and always terminating at the seat of the chalaza. This rib, that it may be distinguished from other furrows or streaks, is named *Raphe*, and is sometimes found very thin and filiform, as in *Paris*, *Hypericum*, &c., and is sometimes thicker, and variously elevated, as in *Helleborus*, *Aquilegia*. &c.

The Regions of the Seed, *seminis regiones*, are five, viz.

B. BASE, *basis*, the extremity of the seed, in which the navel is placed.

C. VERTEX, *vertex*, the region directly opposite to the former.

Obs. This is to be understood of seeds removed from the pericarp, and to take place in oblong and somewhat globular seeds.

D. BELLY, *venter*.

E. BACK, *dorsum*.

F. SIDES, *latera*.

Obs. When the umbilicus is placed in the middle, between the two extremities, or in the margin of a round and rather compressed seed, then that region is named the *belly*, the opposite one the *back*, and the remaining regions are called the *sides*.

But in Seeds, inclosed in a pericarp, the side, contiguous to the common axis, always has the name of belly, and the upper extremity always has the name of apex, even although the umbilicus is situated in it.

2. Situation.

Obs. The situation of the seeds is of great consequence in defining the limits of Genera, and is, especially in carpological disquisitions, of the highest moment, because the situation is found to be the most constant of all the extrinsic qualities. It is determined partly from the figure, partly from the insertion of the seed, and partly from the direction of the radicle of the embryo.

Erect,* *erectum*, when the umbilicus is placed in the lowest part of the seed, the length is parallel with the axis of the fruit, and the radicle of the embryo is directed towards the peduncle of the fruit, as in *Cydonia*, &c.

Inverted, *inversum*, when the umbilicus is placed in the upper, and the vertex in the lower place, and the radicle of the embryo respects the style of the fruit, as in *Caprifolium*, the *Umbelliferae*, &c.

Obs. Inverted seeds are always in a certain respect *pendulous*, but every pendulous seed, or one fixed by its upper extremity, is not to be accounted inverted, for erect seeds may be pendulous, as in *Ruscus*, &c., hence the term *pendulous* does not properly indicate the situation, but the mode of insertion.

Horizontal, *horizontale*, when the axis of the seed cuts the axis of the pericarp at any angle, and the radicle of the embryo either respects the axis or the parietes of the fruit, as in *Chenopodium*, *Tulipa*, the *Cucurbitaceae*, &c.

Nidulant, or Vague, *nidulantia* s. *vaga*, having the navels pointing in every direction, as in *Nymphæa*, &c.

Axipendulous, *axipendulum*, when the proper receptacle is attached to the axis, as in the *Tricoccae*.

Septipendulous, *septipendulum*, when it is attached to the dissepiments, as in *Papaver*.

Valvipendulous, *valvipendulum*, when attached to the valves, as in the *Leguminosae*.

Dorsipendulous, *dorsipendulum*, when attached to the back of the valves, as in the *Orchideae*.

Centripetal, *centripeta*, when there are more seeds than one, and the navels are turned towards the centre; either simply in a single fruit having one or more cells, as in *Corchorus*; or relatively in conjugate fruits, as in *Helleborus*, &c.

Centrifugal, *centrifuga*, or diverging, when the navels are directed towards the circumference of the fruit, as in the *Cucurbitaceae* and *Siliculosae*.

* Amongst about 1050 genera established by Gærtner, he found the seeds of about 375 erect; 209 inverted; 241 centripetal; 130 centrifugal; 21 vague; and about 74 not determinable on account of the want of the nucleus; and he is of opinion that the number of the *centripetal* seeds is naturally the greatest, the number of genera of the *Compositiflorae*, examined by him, being so great (145), as to make the number of the erect seeds greater in proportion, than if the calculation were made from an examination of the seeds of every genus. PRÆF. Vol. II.

Obs. It has been shewn above, that the natural situation of the seeds is changed when the fruit arrives at maturity. And another disagreement in point of situation is here to be noticed, when the number of seeds is different in two different species of the same natural genus, as in *Plantago*, for then the situation of the seeds is usually somewhat different. However, these cases are rather uncommon, and it is to be remarked generally, concerning the situation of the seeds in many-seeded cells, that it is not in these to be too rigorously taken, but that we ought rather to regard the situation of the common receptacle, and from thence determine the situation of the seeds.

3. *Figure.*

Ovate, *ovatum*, a regular ovate or elliptical seed is rather uncommon; and but few occur of a half-ovate (*dimidiato-ovata*) form, as in *Coffea*, and some *Umbelliferae*; but ovate seeds, which are narrowed at one extremity, end in a point, and have the form of a pendent tear, are very common, as in *Pyrus*, *Amygdalus*, &c.; these might be named *dacryoidea*.

Globular, *globosum*, to this head are referred not only those, which are exactly spherical and are very rare, but those also, which with a remarkable thickness have the appearance of roundness; of these the most common are somewhat globular (*subglobosa*), and the rarest are hemispherical (*hemisphaerica*).

Oblong, *oblongum*, amongst these are enumerated the columnar, cylindrical, fusiform, prismatic, and beaked or rostrate, which generally occur in the *Gramina*, *Compositae*, *Umbelliferae*, &c.

Reniform, *reniforme*, reniform seeds both with equal, and unequal extremities are very common, as in the *Leguminosae*, &c.

Lenticular, *lenticulare*, convex on both sides with a circular acute margin, as in *Dodonaea*, *Lens*, &c.

Orbicular, *orbiculatum*, flattish on both sides, with a circular obtuse margin, as in *Tordylium*.

Bracteate, *bracteatum*, not quite round, and compressed into a leaf-like thinness, not easily bent, as in *Tulipa*, &c.

Discoid, *discoideum*, not quite round, thick, and depressed, not capable of being bent, as in *Actaea*, *Swietenia*, &c.

Paleaceous, *paleaceum*, linari-oblong, compressed, rather rigid and stuffed within, as in *Nepenthes*, *Rhododendrum*, &c.

Scobiform, *scobiforme*, formed of a very thin, hollow, membranous aril, containing a globular free seed in its cavity, as in *Pyrola*, the *Orchides*, &c.

Bullate and Meniscoid, *bullatum* & *meniscoideum*, these rarely occur, and are chiefly met with in the *Stellatæ*. They are either simply meniscate, or convexo-concave, as in *Menispermum*, &c.; or on both sides slightly concave, as is generally the case in *Nandina*; or windowed (*fenestrata*) at the same time, having one or more holes opening into their pithy cavity, as in *Bradleja*.

Gigartoid and Turbinate, *gigartioideum* & *turbinatum*, from the obovate belly narrowed downwards into a beak, and generally very hard, as in *Vitis*, *Bryonia*, &c. The Ophiocephaloid (*ophiocephaloidea*) seeds of *Echium*, *Lycopsis*, &c., and the Ram-faced (*crioprosopon*) seed of *Cicer* differ little from these.

Angular, *angulatum*, not infrequent. The angular seeds are regular, and generally three-cornered, as in *Rheum*, *Fagopyrum*, &c.; or more or less irregular, as reniform-angular (*reniformi-angulata*) as in *Lathyrus sativus*, &c., many-sided, (*polyædra*) in *Ophiorrhiza*, &c., and absolutely irregular, as in *Aubletia*.

Straight, *rectum*, either not bending from a right line, or very slightly, and curved only when very old, as in the *Umbelliferæ*, &c.

Curved, *curvum*, very evidently, and before maturity bent into a bow, a hook, a circle, or even sometimes conduplicate, as the central seeds of *Rhagadiolus*, and the peripheral ones of *Calendula officinalis*, as the seeds of *Hippocrepis*, *Arbutus*, &c., and finally as all bullate and meniscate seeds.

Uniform, *uniformia*, most seeds are uniform, for the slight differences, which sometimes occur between the highest, middle, and lowest seeds in many-seeded cells, are not worthy of attention.

Difform, *difformia*, differing remarkably from each other either in their proper form, as in *Atriplex*, *Hyoseris*, &c.; or their accessory parts, as in *Hypochaeris*, *Doronicum*, &c.

4. Consistence.

Juiceless, *exsuccum*, or **Hardish**, *duriusculum*, comprehending,

Almond-fleshy, *amygdalino-carnosum*, a seed retaining the impression of the nail.

Fungous, or Cork-like, *fungosum* s. *suberosum*, which can be opened by scratching.

Coriaceous, *coriaceum*, which can be cut with a knife.

Crustaceous, *crustaceum*, which can be broken by the fingers.

Nucamentaceous, or Bony, *nucamentaceum* s. *osseum*, which can scarcely be broken in pieces by the teeth.

Berried, *baccatum*. Berried seeds are rare, and instead of a shell, or even on the outside of the shell, have a succulent, soft, and, generally, coloured integument.

Obs. They scarcely deserve to be distinguished from Seeds, clothed with a berried aril, as in *Scytalia*, yet they differ from those in this respect, that the flesh in a true berried seed adheres very closely to it on every side, and not only about the umbilicus, as in *Jasminum*, *Ixia*, &c., *Prasium* and *Osteospermum*; unless the seeds of the two last genera may more properly be named *drupaceous* (*drupacea*). The mucilaginous seeds have a very near affinity with the berried.

5. Number.

Obs. This is the most variable quality of seeds, hence it is evident that genera constructed from the number only of the seeds, are merely artificial and precarious. Nevertheless, the number of the seeds is found constant and invariable in many families and natural genera.

Single, *unicum*, as in the *Gramina*, *Cyperoideæ*, *Compositæ*, and *Dipsaceæ*.

Two together, *gemina*, as in the *Umbelliferæ*, and *Stellatæ*.

Three together, as in the *Tricoccæ*.

Four together, *quaterna*, as in the *Verticillatæ*, and *Asperifoliæ*.

Five, Six, and Ten together, *quina*, *sena*, *dena*, are common in various natural genera, as in *Fagonia*, *Geranium*, &c.

Obs. In all these, the constancy of the number proceeds from this circumstance, that the seeds are either naked, or only one in each cell, for, wherever there are more than one in one cell, the number becomes variable.—In all cells therefore the number, if greater than two, is to be deemed inconstant, but is not on that account to be entirely neglected, because the astonishing fertility of some plants, and the various energy of the anthers upon the ovules is known from thence. In *Vanilla* each capsule contains from ten to fifteen thousand seeds! In a single head of *Papaver*, Grew counted eight thousand seeds, &c. &c.—Our admiration is excited by this prodigious fertility: Yet it seems still more wonderful, that in some plants such an enormous number of ovules can be fecundated by very few stamens, and that in others even a moderate quantity cannot be fecundated by numerous stamens; that plants in an eminent degree many-seeded, are those

which have the fewest stamens, and that, amongst the polyandrous plants, there are several which, are scarcely equal to the fecundation of a single one out of all their ovules. From these phenomena it is evident that the fecundation of seeds depends rather upon the quality, and intrinsic virtue of the pollen, than its quantity, and that every vegetable ovule is not destined, by Nature, for a future progeny.

6. Magnitude.

Large, *magnum*, which is not smaller than a walnut, or which exceeds a geometrical inch, whether it be extended in thickness, as *Eontarus* and *Coccos*, or in length, as *Rhizophora*.

Middle-sized, *medium*, between an inch and two lines, neither larger than a hazel nut, nor smaller than a millet seed.

Small, *parvum*, exceeding half a line, but not greater than two lines, contained within the limits of the seeds of a *Campanula* and a *Poppy*.

Minute, *minutum* s. *exile*, smaller than the preceding, and often like dust or powder, as in *Chara*, *Filices*, *Musci*, &c.

7. Surface.

Smooth, *glabrum*, having no conspicuous inæqualities, nor splendor on its surface, as in *Raphanus*, *Brassica*, &c.

Polished, *lævigatum*, smooth, and shining, as in *Amaranthus*, *Sapota*.

Lucid, or Shining, *lucidum* s. *splendens*, the surface shining, but not perfectly smooth, as in *Lithospermum arvense*.

Striated, *striatum*, having either longitudinal streaks, as in the *Umbelliferae*, &c.; or transverse or oblique streaks, as in *Exacum*, &c., or radiating ones, as in *Tradescantia*.

Furrowed, *sulcatum*, marked with thicker streaks, either simple or branched, as in *Aethusa*, *Psychotria*, *Pimpinella agrimonoides*.—To this head belong the

Ribbed, *costatum*, and the Molendinaceous or millstone-like, *molendinaceum*, seed, so named from the thickness or breadth of the dorsal furrows, as in *Caucalis*, &c.

Latticed, *cancellatum*, having the longitudinal streaks, or furrows, decussated by transverse and generally narrower ones, as in *Glaucium*, *Argemone*, *Onopordium*, &c.

Reticulated, *reticulatum*, differing from the former, in the irregularity only of the streaks, as in *Buglossum*, *Hydrocotyle*, &c.

Scrobiculate, *scrobiculatum*, marked with rather large pits, distant, or contiguous, as in *Tithymalus*, &c.

Dotted, or Punctate, *punctatum*, either excavato-punctate, or elevato-punctate, *excavato- aut elevato-punctatum*, with the dots disposed in series, or irregular. These seeds are common in the *Lychnideæ*, *Solanaceæ*, &c.

Apiculate, *apiculatum*, rough with very short and frequently capitate bristles, as in *Drosera*, &c.

Tubercled, *tuberculatum*, rough with thicker elevated dots or tubercles, as in *Hydrocarpum*, &c. Hither may be referred the Muricated (*muricatum*) seed, as in *Ranunculus*, *Cynoglossum*, &c.

Papillous, *papillosum*, covered with flexible scales, or fleshy tubercles, as in *Eryngium*, &c., and in *Codon*, the pimples of which are fleshy, and of a blood red colour.

Vermiculate, *vermiculatum*, marked with elevated serpentine streaks, or a kind of foreign letters, as in *Momordica*, &c.

Marginate, *marginatum*, either thickened at the margin, as in *Cucurbita*, or extenuated at the margin (*marginaceo-extenuatum*) as in *Allamanda*.

Wrinkled, *rugosum*, rough with tubercles, streaks, and pits irregularly intermixed, as in *Aconitum*, &c.

Obs. The hairs, bristles, thorns, wings, &c. observed upon the surface of seeds, as they do not form a proper part of the shell, will be considered amongst the accessory parts of seeds.

8. Colour.

Obs. The colour of seeds, besides its variety, deserves to be noticed on account of seeds being the only parts of a vegetable, which, without the free access of light, are decorated with elegant colours, and because their colours are such as rarely, if ever, occur in the coloured parts of flowers, and, on the contrary, because the most usual colours of those parts are, for the most part, uncommon in seeds.

Honey-colour, Reddish, or Pale red, *melinum*, *rufescens*, *aut helvolum*, these colours are the most common in seeds, the least common in flowers.

Ochrey, Rusty, and Chesnut, *ochraceum*, *ferrugineum* & *castaneum*, after reddish, the most frequent in seeds, and scarcely ever observed in flowers.

Black, *nigrum*, *atrum* & *anthracinum*, peculiar to seeds

alone, for though black spots take place in flowers, the whole flower is never found to be black.

Brown, Tile-colour, and Bay, *fuscum*, *testaceum*, & *spadiceum*, common in seeds and bark, very unusual in flowers.

White, Milky, Snowy, *album*, *lacteum*, *niveum*, more frequent in flowers than mature seeds, although these before maturity are, for the most part, white, Red, Scarlet or Crimson, and Fiery, *rubrum*, *coccineum*, & *rutilum*, common in flowers, rare in seeds, as in *Gloriosa*, &c.

Rosy, *roseum*, a very frequent colour in flowers, scarcely ever observed in seed, except in *Punica*, &c.

Blue, *cæruleum*, a blue seed is very rare, it occurs in *Croton cyanospermum*, and in a variety of *Phaseolus vulgaris*.

Somewhat blue, *subcærulea* or Lead-livid (*plumbeo-livescens*) seeds are met with in *Zingiber*, &c.

Green, *viride*. Green which is so predominant a colour in the vegetable kingdom, is extremely uncommon in seeds. Grass-green seeds are, however, found in *Adonis vernalis*, and in *Balsamina Noli tangere*.

Yellowish-green (*lutescenti-viridia*) ones occur in various species of *Lotus*, &c.

Variegated, *variegatum*, as in *Lathyrus*, *Phaseolus*, &c.

Obs. Seeds assume these and other colours, when they are ripe; wherefore colour is commonly considered as a sign of maturity. But many remain colourless; and the colour often varies by culture, and by age is very frequently changed from a paler to a darker, becoming, from straw-coloured, reddish; from reddish, rust-colour; and from rust-colour, brown. Hence colour can neither safely be taken for a certain sign of maturity, nor for a distinctive specific mark, but it serves to distinguish a seed from the neighbouring parts, and especially from Pyrenes; and we consider that coat as the proper outermost integument of the seed, which is distinguished from the neighbouring ones by its peculiar colour.

IV. ACCESSORY PARTS OF FRUITS, AND SEEDS,

partes fructuum atque seminum accessoriae, such as may be present, or absent, without injury to the structure of the seed.

1. PAPPUS, *pappus*, of various forms, arising from the proper persisting calyx of the flower, and growing to the vertex of the seed only.*

* LINNÆUS considered the pappus as of no consequence, because he did not, or rather would not, know it, lest it should be an impediment to his merely physi-

a. Sessile, *sessilis*, without a stipe, touching the vertex of the seed, and in the form of a crown, as in *Hieracium*, *Valeriana*, &c.

Stipitate, *stipitatus*, supported on a proper stipe, and elevated considerably by it above the vertex of the seed, as in *Leontodon*, &c.

Obs. The Stipe, *stipes*, is either setaceous; or columnari-acuminate, as in *Crepis*; or incrassated, and apparently inflated, in *Tragopogon Dalechampii*, &c. It arises rather late, a little before the maturity of the seed, from the ovary, and out of the vast number of Compound Flowers it is found only in the *Semiflosculosæ*, for the stipe, which is commonly attributed to *Tussilago*, is certainly not one, and that of *Gundelia*, is so short and thick as scarcely to deserve attention. In the *Dipsacæ* a stipe is not uncommon, on account of the superior situation of the radicle of the embryo, and the figure of the seed, which is attenuated upwards.

b. Uniform, *uniformis*, having the same figure in all the ovaries of the same aggregate flower.

Difform, *difformis*, having some of the ovaries of the same receptacle bald, and others furnished with a pappus, as in *Doronicum*, &c., or having the form of the pappus different in different ovaries, as in *Hypochaeris*, *Hyoseris*, &c.

c. Persisting, *persistens*, by means of this seeds may be born into distant regions.

Caducous, *caducus* s. *fluxilis*, this is less frequent, and is chiefly given to the larger and heavier seeds, as *Carduus*, *Onopordum*, &c.; it is, however, also found in smaller, as in *Sonchus*, *Lactuca*, &c.

d. Simple, *simplex*, wholly composed of rays of one form, and is

Calycled, or Marginate, *calyculatus* s. *marginatus*, when the crust of the seed is extended above

ognomonical determinations of these plants. But, on the other hand, we know that the pappus was held to be of great importance by VAILLANT, that he never neglected it in his characters of the genera, and that he examined and defined it with great care, whence his genera are much preferable to the *Linnean*. The difficulties and exceptions, attending the consideration of the pappus, are in general much fewer than is commonly supposed, and are much diminished by a careful attention to the limits, given in our Introduction, between the different species of pappus. For thus it will immediately appear that a Pappus, which is so liberally named feathery by the vulgar, is by no means so frequent, and that a marginate, cup-shaped, or cotyloid Pappus, which LINNÆUS has scarcely deigned to give a name to, is, for the most part, well defined, and conspicuous, so that we cannot do without it in forming the characters of the genera, and ought not to neglect it either within or without the range of Carpology. GÆRTN. Præf. Vol. II.

its vertex, and formed into a one-leaved cup.*

It is either *entire*, as in *Tanacetum*, &c., or halved, as in *Melampodium*, &c.

Chaffy, *paleaceus*, consisting of more than one distinct, dry, rigid, and shining leaflets or scales, and is sometimes not unlike the calyced.†

Obs. The chaffy pappus differs in the number and figure of its chaffs, being *two-leaved* in *Helianthum*; *three-leaved* in *Eclipta*; and *five-leaved* in *Ederia*; *linear* in *Tagetes*; *lanceolate* in *Arctotis*; *obtus* in *Apuleja*, &c.

Awned, *aristatus*, having one, two, three, rarely more, short rigid rays, often hooked backwards, as in *Bidens*, &c.

Stellate, *stellatus*, consisting of five filiformi-attenuated, and spreading rays, as in *Geropogon*, &c.

Thorny, *spinosus*, having acicular and pungent rays, as in *Zinnia*.

Capillary, *capillaris*, very frequent, resembling in slenderness a human hair, yet marked with very minute teeth, which are sometimes nearer, sometimes more remote from each other.

Setaceous, *setaceus*, differing from capillary only

* Objections may be made against the inconstancy of the pappus, and the *marginate* Pappus sometimes is attended with real difficulty, since it is entirely wanting in some cases, where it ought to be present; or has teeth of various depths, so that it can scarcely be distinguished from a calyced, or slightly leafy pappus: examples of the former occur in the species of *Rudbeckia*, &c. and of the latter in some species of *Pyrethrum* and *Buphtalmum*. For these two difficulties there is no remedy except to acquire a knowledge of the seeds of several species of one genus; to call to our aid the flowers and plants themselves, if possible; and finally from the conformity of the greater number of species, and the agreement of the flowers and plants themselves, to learn to estimate and neglect the slighter disagreement in the seeds, for whoever shall chuse to neglect such aids, and demand a method entirely free from defects, is certainly very little versed in the study of nature; otherwise he would not expect very excellent diagnostic signs in every instance, because nature in despite of human rules, sometimes indulges her fancy.
GÄRTN. Præf. Vol. II.

† A difficulty occurs with regard to the membranaceo-paleaceous, or leafy (*phylloides*) pappus, and especially if it have few leaves (*oligophyllus*), or be very narrow; for this, at the maturity of the seed, for the most part falls off, as in *Helianthus*, &c., or dries so much as to be with great difficulty distinguished, as in *Eclipta* and *Baltimora*. The best remedy, in these cases, is to examine the seeds before full maturity, and to moisten the dried leaflets of the pappus with warm water, we shall then be able, by means of a good glass, to find either an entire pappus, or at least the remains of one. Few have avoided the error, arising from the pappus soon falling off, and we have fallen into it by improperly attributing bald seeds to *Scolymus*. GÄRTN. Præf. Vol. II.

in the greater rigidity, and more numerous teeth, as in *Chrysocoma*, &c.

Ciliate, *ciliatus*, betwixt setaceous, and feathery, and with difficulty distinguished from both. It differs from setaceous in the rays being more rigid and generally flattened, and in the lateral teeth being more projecting, and discoverable by the naked eye, as in *Atractylis*, &c. And it differs from feathery in the shortness and rigidity of the cilia.

Feathery, *plumosus*, having setaceous or chaffy rays, with lateral hairs, which are always capillary, and longer than the thickness of the rays, or at least equal to it.*

Obs. The feathery pappus may be divided into feathery strictly so called, the rays of which are furnished with hairs from the base to the apex as in *Carlina*, &c., and pencilled (*penicillaris*), of which the rays are rather naked below, but, towards the apex, are adorned with hairs gradually longer, as in *Stabe*, &c.

Woolly, *lanatus*, occurring only in *Cineraria glauca*, in which the vertex of the seed is crowned with a white ring formed of a very short, and very dense wool.

e. Compound, *compositus*, having rays of a manifestly different form.

Dissimilar, *dissimilis*, having rays of a different form or length on one and the same seed. Thus, in *Tolpis* the outer seeds support two very long capillary hairs, the rest being short and united into a crenulate margin. The seeds of *Hyoseris* are furnished with five longer rays,

* The difficulty, arising from the feathery pappus, is neither so great, nor of so frequent occurrence, as might be believed from the very frequent mention of it made in the writings of Anthologists. For the most part its form is so well and so elegantly defined, that it may easily be distinguished at first view, especially by attending to the length of the lateral hairs, which at least ought to be four times greater than the thickness of the scape. If nevertheless a doubt should arise between a pappus truly feathery, and a *dentato-ciliate* pappus, which is very nearly allied to it, care is to be taken that the comparison be made always between the pappuses of the same division, and not between seeds of different sections, for thus you will easily distinguish the pappuses of *Cirsium* and *Silybum*, and those of *Suprago* and *Critonia*; whilst, if you place the pappuses of *Silybum* and *Suprago* near each other, the former, considered with regard to the latter, may easily seem feathery, although both, in their order, ought properly to be named *dentato-ciliate*. If the difference between the two just mentioned species of pappus be truly doubtful, as in some *Capitata*, and *Pteronia*, the same method is to be employed, which is directed above with regard to the marginate pappus, and it is always to be considered that in human affairs nothing is perfect. GÆRTN. Præf. Vol. II.

besides very many shorter. And in *Zacintha*, and various species of *Cyanus*, some rays are simply setaceous, and others acutely toothed, or pencilled.

Obs. Sometimes a dissimilar and difform pappus occur in one, and the same flower, but in different seeds, as in *Tolpis* and *Hyoseris*.

Geminate, *geminatus*, composed of two simple pappuses, of a different kind.

Obs. The Geminate pappus consists first, of a one-leaved calyculate outer, and a capillary inner pappus, as in *Pulicaria*: secondly, of a calyculate and thorny pappus, as in *Cnicus benedictus*; and thirdly, of a marginate and feathery pappus, as in *Carlina*.

2. COMA, *coma*, this has the nearest affinity with pappus, for, like that, it is formed of hairs placed on the vertex of the seed, and collected into a bundle. It differs however from a pappus, because the hairs in a coma derive their origin not from the proper calyx of the flower, but from the shell of the seed, and because no *comate* seeds are found, which are not covered by a true pericarp, as in *Epilobium*, &c. These therefore are improperly considered as pappous seeds.

3. TAIL, *cauda*, resembling a slender stipe, proceeding from the vertex of the seed, hairy from the base to the apex, and, in the naked seeds, produced from the persisting style of the ovary; but, in the covered seeds, from the shell of the seed; and, in both cases, much longer than the seed as in *Clematis*, *Pulsatilla*, &c.

Obs. The hairy tail, proceeding from the base of the ovary, as in *Typha*, and *Platanus*, is to be accounted a mere and simple peduncle of the fruit.

4. BEAK, *rostrum*, in pericarps this, for the most part, proceeds from the persisting style, as in *Sedum*, *Helleborus*, &c.—Every longer process, not only in fruits, but in seeds, which is rather rigid and incurved, is named a beak or horn (*rostrum s. cornu*), provided it be formed of their substance; it sometimes occupies the vertex, as in *Scandix*, &c., sometimes the back, as in *Curculigo*; and sometimes the base, or umbilical region, as in *Sapota*, &c. and many some.

what reniform seeds, which are from thence named reniformi-rostellate (*reniformi-rostellata*), as in *Salicornia*, &c.

5. WING, *ala*, is a broad flexible membranous expansion, fixed to the vertex, back, or sides of fruits and seeds.

Obs. It is especially called a *wing*, which only occupies the vertex, or back, and a *margin*, which surrounds the sides.

PERICARPS, furnished with wings, are named,

One-winged, *monopterygia*, when furnished with one wing, as in *Fraxinus*, &c.

Two-winged, *dipterygia*, as in the conjugate fruit of *Acer*, &c.

Three-winged, *tripterygia*, as in *Begonia*, &c.

Four-winged *tetraptera*, as in *Tetragonia*, &c.

Five and Many-winged, *pentaptera* & *polyptera*, as in *Guaiaecum*, *Fritillaria*, &c.

SEEDS, furnished with wings, are

One-winged, *unialata*, as in *Swietenia*, &c.

Three-winged, *trialata*, as in *Moringa*, the seeds of *Rheum* and *Fagopyrum* may be referred hither.

Four-winged, *quadrialatum*, except those of *Combretum*, there is no example of four-winged seeds.

A Membranous Margin, *margo membranaceus*, is by no means infrequent in somewhat compressed pericarps, as in *Thlaspi*, &c.: But is much more common in seeds, and is found differently formed in these, viz.

Flat and Entire, *planus* & *integer*, as in *Allamanda*, &c.

Emarginate at the base and apex, *apice* & *basi* *emarginatus*, as in *Syringa*, &c.

Boat-shaped, *cymbiformis*, as in *Calendula*, &c.

Bullate, *bullatus*, as in *Cynoglossum omphalodes*.

Reflected upon the back, in *dorsum reflexus*, and forming spurious cells, as in *Arctotis*, &c.

6. CREST, *crista*, like a wing, but narrower, less flexible, and formed of a coriaceous or cork-like matter.—It is always placed on the back of fruits, and is

Serrated, *serrata*. Laciniated, *laciniata*, &c.

Toothed, *dentibus incisa*, or Curled, *crispata*, as in *Daucus*, &c., &c.

7. RIBS and RIDGES, *costæ & juga*, are elevated, rounded, or muricated furrows, placed on the back of pericarps or seeds, and separated from each other by flattish intermediate spaces, as in *Carpinus*, the *Umbelliferæ*, &c.

8. STROPHIOLES, *strophiola*, are fungous, glandular, or callous epiphyses, generally of an oblong form, and to be found only on the ventral side of the seed, as in *Asarum*, &c.

9. THORNS, *spinæ*, are more frequent in fruits than seeds.—They are Pungent and rigid, *rigidæ & pungentes*, as in *Stramonium*, &c.

Innocent and soft, *molles & innocuæ*, as in *Fagus*, &c.

To this head of Thorns may be referred

Prickles, *aculei*, which are short, pungent, somewhat conical and incurved thorns, as in the Nuts of *Trapa natans*, and the Seeds of *Hyoseris*, &c.

Murexes, *murices*, pyramidal tubercles, often many-angled, or irregular, rendering the surface of fruits rough, as in *Annona*, &c.

Awns, *aristæ*, an addition to the involucre, rather than the seed, as in *Zizania*; however, the seeds of *Geum Laxmanni*, and some Roses, may be named awned.

Hooks, *hami*, thorns inflected at the point, and somewhat hooked, as in *Xanthium*, &c.

10. BARBS, *glochides*, rigid bristles, headed with small retroverted prickles, or supporting a glutinous head, as in *Myosotis*, &c.

11. WARTS, *verruca*, differ from simple tubercles, in being less numerous and more scattered. They are Sessile, *sessiles*, as in *Cucumis*, &c.

Pedicelled, *pedicellatæ*, as in *Spergula arvensis*, &c.

Obs. To this head may be referred those compressed and transverse tubercles in the seeds of *Picris*, &c.

12. SCALES, *squamæ*, foliaceous appendages to fruits. They are

Cartilaginous, *cartilagineæ*, as in *Sagu*.

Fleshy, *carnosæ*, as in *Annona*.

Membranous, *membranaceæ*, and disposed in very elegant stars, shining with a silvery splendour, as in *Croton tinctorius*.

Lineari-paleaceous, *lineari-paleaceæ*, as in *Eryngium*, &c., &c.

13. PUBESCENCE, *pubes*, frequently occurs both on fruits and seeds. It consists of very minute soft hairs, which are more easily perceived by the touch, than the eye; as in the pericarps of *Amygdalus*, &c.; and in the seeds of *Tordylium*, &c.

To this head are referred

Tomentum, *tomentum*, consisting of very short hairs closely crowded, like a coarse woollen cloth, as in *Libanotis*, &c.

Short Soft Hair, *villus*, differing from hair (*pilus*) in shortness alone, hence the seeds of *Cuminum*, &c. are named villous (*villosa*); and the Seeds of *Salix* & *Eriophorum*, &c. hairy (*pilosa*).

Bristle, *seta*, differing from *villus* in rigidity, but agreeing in length. Bristles are

Appressed, *appressæ*; or Patulous, *patulæ*.

Obs. They render the surface rough in some cases, as in *Richardia*; hirsute in others, as in *Wachendorffia*; and hispid also in others, as in the Berries of *Momordica Elaterium*.

Wool, *lana*, consisting of long, flexuose, intricate hairs, as in *Gossypium*, &c.

14. HOARINESS, *pruina*, is a peculiar kind of roughness, arising from hard, unequal, distant granules, either nidulant in tomentum, or in a mealy powder, as in *Myrica*, &c.

Dew, *ros*, may be easily wiped off with the fingers, and is an impalpable pellicle, arising from the exudation of the proper juice, on the surface of soft fruits, as in Plumbs, Grapes, &c. which are said to be dewy (*rorulenti*).

Obs. Amongst the appendages of fruits may be enumerated the singular hair (*pileolus*), which covers the capsules of *Lavatera trimestris*; and those feathery Rays, which surround the capsule of *Heliocarpus*; for, from their singularity, they afford the most certain distinctive marks of those fruits.

PROPER INTEGUMENTS OF SEEDS, *integumenta seminum propria*, the coats investing the nucleus, which do not separate, except under germination, and not even then spontaneously, but are burst irregularly by the swelling cotyledons. They are divided into the Shell (*testa*), and the internal Membrane (*membrana interna*).

Obs. Other coverings of seeds, which are placed between the shell and the pericarp, being closely connected with the former, and occurring only in a few seeds, are named *Epidermis* or *Cuticle*, and *Aril*, and are usually referred to the *accessory Integuments*.

1. **SHELL**, *testa*, when there are two proper coats, this is the outer one; when there is only one, that is accounted the shell; and when there are more than two, the second from the nucleus is to be named the shell.

Obs. The shell is an essential part of the seed, because the nucleus, which in the beginning was wholly fluid, could not have been formed without a coat placed round it; hence it is never wanting, for although, in some mature fruits, the seeds seem to be entirely destitute of an integument, and, from the nakedness of the nucleus, are named *Acocous* (*acocca*), as in *Laurus*, &c., yet in these, previously to full maturity, a shell is present, and the apparent defect proceeds from hence, that the coat of the ovule is gradually so much extenuated, or so closely united with the walls of the pericarp, that it can no longer be distinguished from the nucleus, as in *Rhizophora*; or may be more easily separated from the nucleus than the pericarp, as in *Laurus*.

a. **Consistence.**

Membranous, *membranacea*, thinner than the others, and occurring frequently in seeds, which are naked, cartilaginous, or are lodged within bony cells, or pyrenes. It is

Pellucid, *pellucida*, and almost arachnoid, as in *Oryza*.

Opaque, *opaca*, dry and almost friable, as in *Mes-serchmidia*.

Paper-like, *chartacea*, and somewhat elastic and very tough, as in *Mays*.

Obs. But its texture is most usually soft, as the pellicle of the recent nucleus of *Auellana*, and none more frequently passes into the wings of seeds, than this membranous shell.

Coriaceous, *coriacea*, thicker than the preceding, always opaque, and more frequent than any of the remaining varieties. It is sometimes somewhat cartilaginous, but may always be softened by water.

148 GÄRTNER'S TERMS, &c. Proper Integ. of Seeds.

Spongy, Fungous, Cork-like, *spongiosa*, *fungosa*, *suberosa*, easily receiving the impression of the nail, and formed of a porous substance.

Fleshy, *carnosa*, this only occurs in the berried seeds, and sometimes forms an exception to the rule, with respect to situation; since it often holds the third place from the nucleus amongst the integuments, as in *Magnolia*, &c.

Obs. On this account, it has a very near affinity with *Aril*, and is distinguished from it by this mark only, that a fleshy shell always coheres closely with the whole surface of the seed.

Crustaceous, *crustacea*, thin, not capable of being softened by water, or cut by a knife, but may be easily broken by the fingers. It occurs frequently in *Palmae*.

Bony and Stony, *ossea* & *lapidea*, differing from the preceding, in thickness and hardness only.

Obs. This is uncommon, unless Nuts and Pyrenes be referred hither, as is commonly done. It has been pointed out above, in what these differ from a bony shell, wherefore we shall only add, concerning its texture, that it is almost always composed of very minute and impalpable particles, except in *Camirium*, and *Sapindus*, the shell of which is composed of horizontal, shining fibres; and in *Mammea*, the shell of which is composed of very hard woody fibres, wonderfully interwoven.

b. Very Entire, *integerrima*, having no aperture except at the navel, which is necessarily found in every true shell of a seed.

Obs. Although in *Diospyros*, &c. there is a very deep line, inscribed throughout its whole circumference, so that it might be supposed to be formed of two valves, yet it is perfectly entire.

c. CELLS.

Two-celled, *bilocularis*, as in *Sapindus*, &c.

Obs. One of the most constant properties of this integument is its having one cell with a single nucleus.

With regard to its other properties, it may be observed, that it is of a different and deeper colour than the other parts of the seed; and that, in most seeds, it has no connexion with the nucleus, but may be easily separated from it, except in the cartilaginous, ruminant, and some other seeds, of the tribe of Monocotyledones, in which the shell adheres very strongly to the nucleus.

2. INTERNAL MEMBRANE, *membrana interna*, this is often wanting, but is more frequently present;

and it sometimes seems to be wanting, when it is greatly extenuated at maturity, or so coalesced with the external integument, that it cannot properly be distinguished, much less separated, from it. It always closely invests the nucleus, but secedes freely from the shell. It is

Membranous, *membranacea*; or

Somewhat spongy, *subspungiosa*, which is more rare.

Obs. It has no aperture, not even an umbilical one, but is a close sac, over the external surface of which the umbilical vessels creep, and open within its cavity, so that this membrane seems to be formed of the umbilical vessels, and the Chorion of the ovule. The *chalaza* is situated in this membrane.

Chalaza, chalaza, a small deep-coloured areola, or a small spongy, or callous tubercle on the outer surface of the internal membrane of the seed, deriving its origin from the extremities of the internal umbilical vessels, or from the juiceless remains of the Chorion. Pl. XI. f. 9. b.

Obs. 1. It is found in many, but not in all seeds, and is either placed near the external umbilicus, or diametrically opposite to it. The former situation, which is very uncommon, exhibits the following various forms of the Chalaza, viz. a black sphacelated areola in *Eleusine*, a thick fungous prop in *Mays*, and a small spongy scale in the seeds of *Hibiscus*, *Lavatera*, and other *Malvaceæ*.—On the other hand the situation, opposite to the umbilicus, is the most frequent, and then the *Chalaza* is always round with a moderate convexity, as in *Citrus*, *Alchemilla*, &c., &c.; in all which the colour of the chalaza is found deeper, and its connexion with the internal integument very close.

Obs. 2. The internal surface of this integument corresponds in simplicity with the external, both being smooth and uniform in almost all seeds. Nevertheless there are various processes formed of the internal membrane, which intersect the nucleus in different manners, thus in all ruminant seeds, they mix with the substance of the albumen and render it variegated, as in *Myristica*, &c., &c.

The ACCIDENTAL INTEGUMENTS are superadded to the shell of the seed, and either wholly or partially cover it in such a manner, that they may be easily removed.

CUTICLE, *epidermis*, a thin pellicle investing the whole seed, and never separating from it spontaneously.

Obs. A Cuticle of this kind is found in a great number of seeds, on a nice examination: But here is understood one, which is easily conspicuous; which, being scraped off by a knife, leaves behind it, a very smooth shell, coloured and generally shining; or which, when softened by water, swells in a remarkable manner, and assumes a peculiar consistence. A Cuticle of this kind is by no means frequent.

Membranous, *membranacea*, a dry pellicle concealing the proper colour, and smoothness of the shell, frequently rough with hairs, granules, or hoariness, and adhering so closely to the seed as not to be separated, except by scraping it, as in *Convolvulus*, &c.

Mucilaginous, *mucilaginoso*, this is never observed, except when seeds are thrown into water, that their surface may be softened, and resolved into a jelly, or mucilage. It occurs frequently in the *Siliquosa*, in *Cydonia*, &c. It differs in being more or less thick and pellucid.

ARIL, *arillus*, covering the seed, either wholly or partially, and adhering only to the navel.

a. Complete, *completus*, covering the whole, or at least the greatest part of the seed.

Fusiformi-, or Scobiformi-membranous, *fusiformis. scobiformi-membranaceus*, formed of a thin membranous tube, attenuated at both ends, and closed at one of its extremities, and containing, in the middle of its cavity, a very minute globular seed, as in *Pyrola*, &c.

Paper-like, *chartaceus*, formed of an elastic plate, and assuming the form of its seed, as in *Coffea*, &c.

Membranaceo-pulpous, *membranaceo-pulposus*, pervious at the apex in *Euonymus*; elastic and striated in *Oxalis*, &c.

Berried, *baccatus*, as in *Scytalia*, and *Limonia*.

Obs. The pulpy follicles of the *Bryonia* are between an Aril, and the flesh of a stuffed cell, because they contain more than one seed.

b. Incomplete, *incompletus*, covering a part only, and often a very small part of the seed, but firmly cohering with the navel, and falling from the pericarp with the seed.

Obs. It resembles a membranous thong in *Turnera*, two conduplicate chaffs in *Pedaliu*, it has the form of a thin plate, ciliate or torn at the circumference, in *Commersonia*, &c. It forms a coriaceous many-cleft cover in *Myristica*, and has the name of *Mace*: a fungous cup in *Abroma*; it resembles a glandular or pulpy funnel, in which the navel of the seed is deeply immersed, as in *Cupania*, &c.

VI. KERNEL, OR NUCLEUS, *nucleus*, the part filling the internal cavity of the integuments, of an herbaceous,

or almond-fleshy substance, and generally composed of four distinct parts, namely, *Albumen*, *Vitellus*, *Cotyledons*, and *Embryo*.

1. **ALBUMEN**, *albumen*,* that part of the kernel, which takes its origin and form, at the maturity of the seed, from the condensed liquor of the Amnion, in consistence and colour it much resembles the white of a boiled egg in many seeds, and affords the same support to the germinating embryo, which the chick draws from the white of the egg. Pl. XI. f. 4. b.

Obs. Grew first gave the name of *Albumen* to this part of the Nucleus; by Malpighi it is referred to the *internal Secundines*; by Gleichen it is named *seminal Placenta*, and from Meese and Boehmer it has obtained the name of *Cotyledon*.

Linnæus, from misunderstanding Malpighi, has wrongly asserted, that there is no albumen in the vegetable egg, and that it is of no use in the seed. He would have said with more truth, that it is not found in all. For some seeds have so small a quantity of the liquor of the Amnion, that the albumen cannot be formed from it, as in the more imperfect plants; others, although in their first formation containing a copious liquor of this kind, produce no albumen, because the whole Amnion is absorbed and removed by the growing embryo, before the maturity of the seed; and others are furnished with such a small and slender albumen, that it may easily be overlooked, and indeed may be conveniently neglected, because it is better to admit no albumen, than such, as is not tolerably conspicuous.

In determining therefore the presence of the Albumen, its thickness is chiefly to be attended to, and this is to be defined by certain limits, that all chance of ambiguity may be avoided. To *Exalbuminous Seeds*, therefore, we not only refer those, which have not the least vestige of an albumen; but all those, of which

* The *albumen* is not an essential part of a seed, nor ought it to be taken, without very great circumspection, as a distinctive mark: or rather it ought not to be taken, except in conjunction with the other parts of the seed; because it may be present, or absent, not only in the genera of the same natural order, but even in different genera of the same species, as for example in *Scabiosa*. Therefore in general, first, the albumen is never to be taken alone as the character of an order, and only very rarely as a distinctive generic mark; and secondly, the *consistence* of it is of less importance than the *situation*; and this than its *conformation*. From the former qualities certain diagnostic signs very rarely arise, but from its conformation valuable characters of the genera, and an unexpected agreement between very different plants, may be more frequently made out, thus the seeds of *Plumbago*, *Coccoloba*, *Rheum*, and *Fagopyrum*, only have a *two-parted* albumen, &c., &c. GÆRTN. Præf. Vol. II.

the albumen grows to the internal integument of the seed, and is only equal to, or even thinner than the same, as in *Pyrus*, &c. *Albuminous Seeds*, on the contrary, are those of which the albumen constitutes the greatest part of the nucleus, as in *Triticum*, &c.; and also those, in which the fleshy or mealy layer of albumen is manifestly thicker than the internal membrane, as in *Allamanda*, the *Malvaceæ*, &c.

If the albumen be thus limited, it will be found to be wanting in many seeds, and even whole natural families are entirely destitute of it, as all the *Compositæ*, *Verticillatæ*, *Siliquosæ*, *Cucurbitaceæ*, and *Asperifoliæ*. In the *Leguminosæ*, a very great number of the genera are without albumen, whilst a few are furnished with it; in the *Dipsacæ* and *Malvaceæ* there are more genera with albuminous than exalbuminous seeds. However, if all the known genera be examined, the number of albuminous seeds is much greater than that of the others, for the albumen is present in the following natural Orders, viz. *Gramina*, *Cyperoideæ*, *Palma*, *Lilia*, *Orchides*, *Umbelliferæ*, *Stellatæ*, *Tricocæ*, *Vaginales*, *Coniferæ*, *Multisiliquosæ*, &c., besides a great number of scattered genera; hence the dignity and use of this part of the nucleus, in the vegetable economy is abundantly evinced, and deserves to be carefully attended to.

It supports and defends the embryo, whilst shut up in the seed, and serves for the first nutriment to the same, when it begins to germinate. Every albumen, under the germination of the seed, is dissolved into its primitive juices, or others like them, and is wholly absorbed by the seminal plant, for it never passes out of the shell, much less emerges above the earth like the Cotyledons. It has never any connexion with the embryo, whether it surround, or is surrounded by the embryo, but is always so distinct as to be very easily detached from it.

a. SITUATION.

Obs. It is constantly placed within the internal membrane of the seed, but, with respect to the embryo, it is three-fold.

External, or Vaginal, *externum s. vaginale*, containing the embryo shut up within its substance, and covering it in such a manner, that it cannot be seen, after the removal of the integuments, unless the albumen be dissected. This situation is the most natural, and frequent examples of it occur in the *Umbelliferæ*, *Cyperoideæ*, &c. &c.

Internal, or Central, *internum s. centrale*, having the embryo placed round it, and either wholly con-

cealing it, as in *Custuta*, &c.; or, at least in its circumference, is surrounded by the embryo as by a ring, as in the *Lychnideæ*, &c. The embryo, in this situation of the albumen, appears naked on the removal of the integuments, and is not covered by the albumen on its back, as it is in various *Stellatæ*, and *Solanaceæ*, in which, indeed, the embryo is peripheral, but is not placed without the substance of the albumen, and the albumen of course is not truly central.

Opposite, or Unilateral, *oppositum* s. *unilaterale*, having, like the preceding, the embryo affixed to its surface, but much too short to surround its whole circumference, as in *Dianthus*, *Polygonum*, &c.—In the *Gramina* the albumen is not only placed at the side of the embryo, but is absolutely separated from it by the intervention of the *Vitellus*.

b. FIGURE.

Obs. This is determined chiefly by the integuments of the seed, yet sometimes the embryo contributes its share. Thus every *vaginal*, and *unilateral* albumen is adapted to the cavity of the shell, and is of the same shape with the seed, or nearly so, being globular in globular seeds, &c. But the figure of the *central* albumen is always adapted to the space, which is left free within the shell of the seed, by the peripheral embryo, hence its figure is irregular, and never the same as that of the seed.

c. CONSISTENCE.

Obs. The albumen is supposed to be fresh; and neither old, nor too much dried; the older seeds, previously to the examination of their albumen, &c. should be steeped for some time in water.

Mealy, *farinosum*, of a snowy colour, and easily rubbed into a true meal. It is sometimes so tender, as to be rubbed by the Fingers, as in *Mirabilis*, &c. It sometimes possesses a glass-like hardness and transparency, as in *Oryza*; but it most frequently resembles an opaque, brittle, dry paste, as in the *Cerealina*. It occurs frequently in the *Gramina*, &c. and generally in all those seeds, of which the embryo is disposed in a circular or spiral form, or the cotyledons are plaited, convolute, or writhed. It has the embryo placed on the outside of it more frequently than any other species, and, never abounding with a thick oil, it never becomes rancid.

Fleshy, *carnosum*, by far the most frequent, since it comprehends every albumen, which can neither be conveniently referred to the *Mealy* nor *Cartilaginous*, and possesses a middle consistence between them both. It is

Friable, *friabile*, differing only from mealy by its paler colour and oleaginous smoothness, as in *Piper*, &c.

Sebaceous, *sebaceum*, brittle, and capable of being scraped like Suet, with some degree of transparency from an intermixture of fatty particles, as in the *Tithymali*.

Cheese-like, *caseosum*, having the consistence of Parmesan cheese, and of a watery, glaucous colour, as in *Lathræa*, &c.

Coriaceous, *coriaceum*, tough, and like leather, although well softened in Water, as in *Lontarus*, &c.

Herbaceous, or Almond-fleshy, *herbaceo-s. amygdalino-carnosum*, having the consistence of the white of a boiled egg, easily softened by water, and resolved into a tremulous pellucid jelly, as in the *Leguminosæ*, &c.

Cartilaginous, *cartilagineum*, of a horny hardness, scarcely capable of being softened by water, and always of a cartilaginous whiteness in fresh seeds.

Obs. This is less frequent than the other species, but is not very uncommon, for it is found in most *Palmae*, in *Asarum*, *Rubia*, *Gallium*, &c., &c. It never has the embryo placed on the outside of it, nor is it even ever associated with the Vitellus, as the other species of albumen are.

d. FABRIC.

Obs. Two kinds of cavity are observed in the albumen; one more common, for receiving the embryo; the other very infrequent and constantly empty. The name of a *True Cell* may be given to the former, it occurs very constantly in every *vaginal* albumen, but in the *unilateral*, and in the *central* it is either entirely wanting, or at least appears in the form of a furrow or pit, in which the embryo is partially immersed, and naked in the other parts. This cell is exactly adapted to the form of the embryo, except in the seeds of *Rajania*, *Dioscorea*, *Styrax*, and a very few other seeds, in which the embryo is much smaller than its cell.—In all the seeds, hitherto known, this cavity is solitary, even when twin embryos are present in one seed, as if by superfœtation, except *Menispermum*, the albumen of which has a double cell, namely, one for each cotyledon.

The latter, or *Spurious Cell*, is very rare, and in the extensive tribe of *Dicotyledones* occurs only in *Myristica*, and amongst the *Monocotyledones* it is observed only in the seeds of some *Palmae*. It is constantly

placed in the middle of the albumen, and is closed on every side, except that it sometimes runs into the true cell, as in *Myristica* and *Lontarus*. In older seeds it is always empty, but in the recent *Cocos*, and perhaps other *Palmae*, it is full of a sweet lymph, which gradually degenerates into an acerb vinegar, and at length entirely disappears. In some instances this cavity is very large, as in *Lontarus* and *Cocos*, and in these also the albumen resembles a thick fleshy bladder, but in the rest is narrow, and either regular, or irregular.

Divided, *divisum*, spontaneously separating into two, scarcely ever more parts, or at least gaping, after the internal integument of the seed is removed.

Two-parted, *bipartitum*, as in *Fagopyrum*, &c.

Half-two-cleft, *semibifidum*, as in *Cynocrambe*.

Obs. It is marked with a simple longitudinal fissure on both sides, as in *Cassia Fistula*.

Furrowed, *sulcatum*, having one deep dorsal furrow, as in *Phœnix* and various *Gramina*; or resembling an ovato-oblong plate with the lateral margins reflected, and either convoluted towards the back or belly of the seed, as in *Caucalis* and *Smyrnum*. In the latter case it is named Convolute (*convolutum*).

Lobed, *lobatum*, divided by longitudinal incisions into larger portions, cohering with each other.

Three-lobed, *trilobum*, in *Lontarus*.

Five-lobed, *quinquelobum*, in *Aquilicia*.

Grumose, *grumosum*, compounded of small irregular molecules, cohering with each other, as in *Hedera*, *Cocos nucifera*, &c.

Rimose, or Chinky, *rimosum*, differing little from the preceding, except that the molecules, into which it is divided, are separated from each other by the intervention of membranous plates, proceeding from the internal integument, in such a manner that these plates do not cohere with the substance of the albumen, as in *Annona*, &c.

Ruminate, *ruminatum*, very like the rimose, yet very different from it; formed by an inextricable union of the integuments, especially the internal membrane of the seed, with the substance of the albumen, so that the body of the nucleus appears mixed, and being dissected in different directions, exhibits a great variety of different-coloured spots and streaks, as in *Myristica*, &c.—The somewhat ruminate (*subruminatum*) albumen of *Anguillaria* might be added to these.

e. COLOUR.

White, or Snowy, *album* s. *niveum*, in the mealy.
 Somewhat milky, *sublacteum*, in the cartilaginous.
 Whitish, *albescens*, in the fleshy.
 Grass-green, *gramineo-viride*, in the fresh seeds of *Viscum*, &c.
 Yellowish, *lutescens* & *melinum*, in older seeds.
 Yellow, *flavum*, in the Albumen of *Bocconia*.
 Watery-glaucous, *aqueo-glaucum*, in *Helleborus*, &c.
 Reddish, or Bloody, *rubicundum* s. *sanguineum*, in *Codon*.

Obs. All these colours, except the green, are converted by water in a short time into white.

f. SMELL and TASTE.

Obs. Few seeds are odorous, sapid, and aromatic, insomuch that these, on this very account, deserve to be noticed, as the Seeds of *Zingiber*, *Myristica*, *Xylopi*a, *Piper*, *Illicium*, and a few others, of which the virtue resides in the albumen alone. Amongst the *Umbelliferae* there are some odorous seeds, but, in these, the smell seems to proceed from an unctuous liquid, lodged between the coats of the seed, and imparting its smell and taste to the albumen. In the genus *Myristica* only one species produces aromatic seeds.

2. VITELLUS, *vitellus*, of different forms, placed between the embryo and albumen, and different both from the cotyledons and albumen. Pl. XI. f. 1. c.

The Diagnostic marks of the Vitellus are, First, That it has a very close connection with the embryo, so that it cannot be detached from it without injuring its substance. Secondly, That, notwithstanding this union, it is never carried without the shell of the seed under germination, nor does it become a seminal leaf, as the cotyledons are wont to do, but, like the albumen, is wholly destroyed by the seminal plant, and converted into its nourishment; and Thirdly, That, if the albumen be present, the Vitellus occupies the middle place between it and the embryo, in such a manner, that it can be very easily separated from the albumen without any detriment to its form. Hence it is evident that it has on one hand some affinity with cotyledons, and on the other with the albumen, and that it can not properly be associated with either of those parts. It is the most singular and by far the most uncommon of all the internal parts of the seed.

The most simple *form* and *fabric* of this part is found in the seeds of the more imperfect plants, viz. the *Fuci*, *Musci*, and *Filices*; for in these the whole nucleus is a pure Vitellus, formed of mere herbaceous or almond flesh, and very exactly adapted to

the cavity of its shell. The Diagnosis of it is difficult, in these instances, but it cannot be referred to the albumen, to which it is in other respects very like, because it does not contain within itself a distinct embryo, but is found perfectly solid, and, which is of the first consequence, because, near the umbilicus of the seed, it has a *germinating Cicatrice* growing to it, not separable from the remaining substance of the nucleus, nor even distinguishable from it, but by its paler colour, and more medullary consistence, as in the Seeds of *Lycopodium*. Much less can this nucleus be considered as a solid cotyledon, because in the germinating seeds of the *Musci* we see very distinct cotyledonous leaflets, arising below it from the seed, and we see it adhering to these new and true cotyledons, a long time after their appearance, and the seminal plant consuming and destroying it. From these circumstances it is very evident, that these kernels can neither be referred to the cotyledons, nor to the albumen, but that they are of an intermediate nature, or the nature of a Vitellus.

The Fabric of this part is more evident in *Ruppia* and *Zamia*; in *Ruppia* the nucleus is very like to a fleshy albumen, and the whole is solid, as in the preceding cases, but instead of a simple Cicatrice there is found a cylindrical-acuminate radicle, already formed within the shell, which, being entirely free at one of its extremities, is placed obliquely in a proper furrow, inscribed in the vertex of the nucleus, and at the other thicker extremity, is so intimately united with the substance of the nucleus, that by this union an evident sign of a Vitellus is impressed upon this nucleus. In *Zamia* the Vitellus is still more like the albumen, since it has a hole penetrating two thirds of its length, and within this canal has a long flexuose and capitate radicle, but since this radicle, which is only free at its upper part, is at its lower part intimately mixed with the nucleus, and formed into one body with it, it is evident that the name and office of a Vitellus may be applied to this nucleus. From this singular fabric, it is also clear in what manner a simple germinating Cicatrice is gradually transformed into an incomplete Embryo, and it is very remarkable, that this metamorphosis takes place in seeds, immediately after the antheral pollen is produced in the male apparatus of the plants.

In *Zostera*, *Ceratophyllum*, and *Nelumbo*, the Vitellus approaches nearer to the form of a true cotyledon, being formed of a white almond flesh, and divided into two lobes. In *Zostera* it is lenticulari-compressed, and is half two-cleft on one side quite to its axis; from the middle of the juncture of its lobes issues a hooked radicle, one extremity of which is free, and the other implanted in the middle of the axis of the nucleus, and by this singular insertion the nucleus is rendered abundantly distinct from true cotyledons. But in *Ceratophyllum* and *Nelumbo* the Vitellus only differs from the

Cotyledons in this, that its lobes about their base, are so extensively united betwixt themselves and with the radicle that they entirely hide this, and that they remain shut up within the shell under the germination of the seed, hence those lobes ought strictly to be ascribed to the Vitellus, but from their habit they may commodiously be enumerated amongst the cotyledons.

In the *Gramina*, this part has a new form, and there is a new combination of the parts of the seed, for in these the Vitellus has the figure of a scutiform scale, to which the embryo adheres anteriorly, and the large body of the albumen posteriorly. In all the true *Gramina* a fleshy compressed body is found, which on the outer side is flattish, or hollowed out by a longitudinal furrow, in which the embryo lies, but on the other has an equable surface, by which it is joined to and agglutinated with the albumen. This particular appearance of the Vitellus we distinguish by the name of the Cotyledonous Shield, and assume it, with confidence, as the essential and characteristic mark of the Grasses, because it is found in all of them, and in no other known seed. Its figure is various, being orbicular in *Briza*, elliptical in *Cenchrus*, &c., &c.—Its Consistence is commonly the same as that of the Embryo, viz. almond-fleshy, hardish, and either white or yellowish.—The Situation is always in the inferior, or lateral part of the albumen, so that when the integuments are removed, the embryo with its shield, placed on the outside of the albumen, come into view. It has no connexion with the albumen, or at least not an organical, but merely a superficial one, but, on the other hand, its connection with the embryo is very close, and always conspicuous near the beginning of the radicle, so that in this part the substance of the shield and the embryo form one confused indistinct body. The Plumule is constantly free, and the whole embryo at its anterior part lies, for the most part, denuded in the furrow of the shield, but in a few is covered by the margins of this, which are plaited inwards, as in *Mays*, and again in others, the radicle lies within the substance of the shield, as within a sheath, and is entirely wrapped up in it, as in most *Cerealia*.

A Fabric somewhat similar to the preceding is found in some *Scitamina*, as in *Zingiber*, &c. These have a vaginal Vitellus, or a certain fleshy body, placed in such a manner between the Albumen and the Embryo, that it shuts up the latter within it, as in a sheath, and externally it has the mealy substance of the albumen placed around it on every side. This sheath is constantly pervious at the summit, and the uppermost part of the embryo always projects a little beyond its aperture, moreover at the end of the radicle it seems to be sometimes perforated, but in the middle it is very entire and thick, and has a different figure in different species, as

funnel-shaped in *Zingiber Maleghetta*, turbinate in *Z. nigrum*, ovato-oblong in *Z. sylvestre*, &c.

All the species of *Vitellus*, hitherto enumerated, except perhaps the kernels of *Ceratophyllum* and *Nelumbo*, differ very considerably from the ordinary organic parts of the seed, and, without doubt, constitute a proper genus of a viscus. But since, amongst the ordinary parts themselves, there are various ones, which recede so much from the usual form, that they seem to agree very nearly with the *Vitellus* in nature and properties, mention will be made of some of them, as examples of a *Spurious Vitellus*.

Amongst these the nucleus of *Rhizobolus Peckea* deserves the first place. It is very large, solid, almond-fleshy, and fills almost the whole of the cavity of the shell: from the anterior part of its base it sends forth a short and two-edged scape, which, being inflected upwards, and terminated by two cotyledonous leaflets, lies upon the nucleus below. It appears from hence that this is the true embryo, and, that the nucleus, strictly speaking, is nothing else than the radicle of the embryo, encreased to an enormous size; but because this radicle, which is very different from all hitherto known, never can put off its shell, and produces new and true radicles, under germination, from itself, in order that the plant may be fixed in the earth, its nature may be thought ambiguous, and in some measure resembling a *Vitellus*.

In *Trapa* a similar anomalous nucleus occurs. It has the size and form of the cavity of the shell, the almond consistence, and is wholly solid; from the vertex it puts forth a columnar radicle, which, a little above its origin, supports a minute squamiform cotyledon entirely detached from the nucleus, a circumstance which ought to be well attended to. This nucleus, therefore, may, and indeed, according to analogy, ought to be accounted a larger cotyledon; but since, contrary to all custom, it is remarkably distant from the smaller one, and is never carried out of the shell under germination, its nature is doubtful and approaches very near to the *Vitellus*, and *Trapa* is very nearly allied to the mono-cotyledonous plants, as Adanson also suspected.

Finally, the hypogean or subterrestrial Cotyledons are not to be passed over unnoticed; for although, on account of their regular form, and the radicle being always placed without the lobes, and not covered by their substance, they neither can, nor ought to be separated from the rest of the true cotyledons; yet on account of their incapacity for germinating, and the coalition of their lobes into one body, as in *Tropæolum*, *Hippocastanum*, &c., they differ so very little from the *Vitellus*, that there is the closest bond of affinity between these parts; and, in general, Nature, in producing these parts of the nucleus, seems to proceed from the very simple tex-

ture of the albumen insensibly to the more organic structure of the Vitellus, and from this to the more perfect fabric of the cotyledons.

3. **COTYLEDONS**, *cotyledones*, organic parts of the nucleus, simple or divided, which together with the radicle and plumule form the body of the embryo, and, by the germination of the seed, are generally converted into the first leaflets of the new plant, which are more commonly different from the succeeding ones.

Obs. They are called Valves of the seed (*valvæ seminis*) by Jungius, Seed-Lobes (*lobi seminales*) by Gleichenius, and Seminal Leaflets (*foliola seminalia*) by others. But the name of Cotyledon, adopted by Linnæus, is preferable, as not implying any certain and definite figure of the parts; and as suiting equally well the *involute* and *evolute* cotyledons.

They derive their origin from the embryo, of which they always constitute an integrant part. The simple or undivided cotyledons, especially, are produced from the mere extension of the Corcle or first medullary point, and are nothing else than the scape of the embryo more or less distinct from its radicle, as in the *Palma*, *Gramina*, and *Lilia*. But the double or conjugate cotyledons are formed by the fissures, which divide the part of the corcle, opposite to the radicle, into two, and generally equal, lobules. These lobules, at first, represent mere tubercles, and in many seeds retain this form unchanged; but in others, they are gradually extenuated into plates, which, by their diverging wings, swim upon the liquor of the Amnion, and derive from it all their nourishment, so that by the consumption of this, and of the Chorion, they are shortly increased, and by degrees assume the proper form of cotyledons. The nearer a seed approaches to maturity, the nearer their plates are mutually brought to each other, and at length touch every where on their internal surfaces, and then also, from being straight and flat, they become curved, flexuose, convolute, gibbous, in a word of the same form with their intrinsic model. The increase is in some instances quicker, in others slower, and in general is different in different ones, but its ultimate limits are so fixed and invariable, that in many thousand seeds of the same species, the same proportion of the cotyledons, not only to the cavity of its shell, but to the remaining parts of the nucleus or embryo, is constantly observed.

a. FABRIC.

Obs. It is composed generally of three distinct parts, viz. Epidermis or Cuticle, Parenchyma, and the Tracheæ or Vessels.

Cuticle, *epidermis*, investing the whole surface of the cotyledons, and serving them partly as a filtre, through which the liquor of the Amnion passes; and partly hindering them from coalescing with the neighbouring bodies, for all cotyledons are always equally distinct from the integuments, and albumen, and may be easily separated from both, except in *Barringtonia*, and *Mangostana*.

Parenchyma, *parenchyma*, this manifestly proceeds from the internal bark of the embryo, and is formed of cellular texture, in the interstices of which are lodged a thick oil, and other inspissated liquors.

Obs. The parenchyma alone forms almost the whole mass of the cotyledons, and in general is either of a herbaceous, almond, or somewhat coriaceous consistence, and chiefly serves for depurating and containing the nutritious juices: for before germination, or at the beginning of it, all the aliment of the embryo comes into the bibulous cotyledons, and is from them delivered to the radicle and plumule; but as soon as the radicle inheres in the earth, then the nutritious liquor passes by a contrary route from the embryo into the cotyledons, to be there depurated by exhaling, or, by receiving thinner particles from the air, to be rendered fitter for motion. This purpose is served chiefly by the Tracheæ.

Tracheæ, *tracheæ s. vasa*, vessels dispersed through the whole cellular texture of the cotyledons, and connecting them intimately with the embryo.

Obs. They always arise from the fleshy substance of the embryo, immediately below the origin of the plumule, and terminate with their extremities in the parenchyma, or the surface of the cotyledons, that they may be of use to the seminal plant both by exhaling, and absorbing. They have the same use therefore, and the same fabric and distribution, which they have in the vessels of the leaves. In the thinner cotyledons they are at all times conspicuous, and in the thicker, they are easily rendered obvious to the senses by germination, and the injection of a coloured liquor.

b. NUMBER.

Obs. The number is more constant in the Cotyledons, than in any other part of the fructification, and seems rarely to have varied. Hence Ray, Boerhave, Heister, and others, have founded their methods of plants chiefly upon the number of the cotyledons, and have divided Vegetables generally into *Acotyledonous*, *Monocotyledonous*, *Dicotyledonous*, and *Polycotyledonous*. But this distribution does not afford sufficiently pure natural classes of Plants, and in Carpology presents considerable difficulties, because the true number of the cotyledons cannot be certainly learnt, except from the germination of the seed, nor can always a safe judgement be formed concerning the number of the future cotyledons from the fabric of the embryo alone: for from an acotyledonous seed sometimes proceeds a polycotyledonous

plant, as in the *Musci*; from a monocotyledonous plant proceed sometimes plants, in their whole nature allied to the dicotyledonous, as in *Cuscuta*, and *Melocactus*; and from a seed, manifestly dicotyledonous, plants may be produced, attended by only one cotyledonous leaflet, as in *Nelumbium* and *Trapa*. Hence we ought carefully to distinguish between *Involute* and *Evolvute* Cotyledons, as from the former the number of cotyledons of the embryo or seed are to be defined in Carpology, and from the latter that of the declared plant in Phytology.

A Seed is *acotyledonous*, *monocotyledonous*, *dicotyledonous*, or *polycotyledonous*.*

a. *Acotyledonous*, *acotyledoneum*, which has no conspicuous or distinct embryo, but contains within itself only a mere germinating cicatrice, or a certain simple rudiment of a radicle, implanted in a nucleus several times larger than itself, as in *Ruppia*, *Zosteria*, *Zamia*, the *Fuci*, *Musci*, and *Filices*.

Obs. A Plant is named *acotyledonous*, which, without any preceding vestige of a true leaflet, springs from the earth a frond of different species, but perfectly like the mother plant. Plants of this kind are rarely propagated from seeds, but more frequently arise from simple or fruit-like (*carpomorphi*) buds, as the *Fungi*, *Lichenes*, *Conferve*, and some other *Algæ*.

b. *Monocotyledonous*, *monocotyledoneum*, containing within it a very entire embryo, without any perceptible chink, and either entirely free, or at least loose from the rest of the nucleus, at the extremity opposite to its radicle.

Obs. These seeds are of two kinds, viz. *true monocotyledonous*, having the embryo formed, from its first production, of one individual body, and so composed of a medullary and cortical substance, that in every

* This division of seeds is the unshaken basis, and fundamental principle of all Carpology, for every seed, whilst it remains a seed only, must necessarily be referred to one of these classes. But the whole scene is changed, as soon as the seed germinates, and the embryo is converted into a true seminal plant, for then these classes, which were pure in Carpology, are not pure in Phytology, each of them containing plants, which do not answer to their primitive carpological character. Nevertheless, in Phytology, or a methodical contemplation and arrangement of evolved plants, these four classes ought not to be rejected, because the exceptions are not numerous, and because, by a careful observation of the germinating seed, connections between these different classes are detected, which were not before expected, and which deserve every attention of the botanical philosopher. Thus we learn that monocotyledonous plants are conjoined on one side with the acotyledonous, as by *Anthericum*, *Hyacinthus*, &c., and on the other with dicotyledonous; that dicotyledonous and polycotyledonous plants are so closely connected, that they almost become one class; and finally that acotyledonous plants, besides their connection with the monocotyledonous, are also conjoined by other bonds with the polycotyledonous. GÄRTN. Präf. Vol. II.

transverse section of the embryo, the double substance appears distinct, and very entire; and *false monocotyledonous* (*pseudo-monocotyledonea*), containing, as well as the former, a solid and undivided embryo, but, at its first production, parted into distinct lobules, and afterwards, from the lobules being united at maturity, transformed into a solid and individual body, as in *Tropæolum*, *Paullinia*, &c. Besides the different formation of the embryo, they are distinguished from the former by the following signs also: First, the medullary and cortical substance are found conjoined in the radicle of the embryo only, and not in the rest of its substance: Secondly, there is often a manifest plumule within the cotyledonous mass, which is constantly absent from every true monocotyledonous embryo: Thirdly, the internal substance of the embryo is for the most part marked by obsolete transverse streaks, which are certain marks of the former divisions into lobes, since in the former the medulla is always found uniform and very entire; and Fourthly, because the bulk of those cotyledons is always very large, and never only equal to the radicle, or narrower, as is the case in the former, for in these the whole embryo is almost always narrower than the cavity of its shell, and many times smaller, and covered by a very large albumen, except indeed very few, viz. *Potamogeton*, *Triglochin*, *Sagittaria*, and *Alisma*, in which alone the seed is exalbuminous. Therefore all the false monocotyledonous seeds properly belong to other classes, and most of them are dicotyledonous: one seems to be polycotyledonous, namely, the seed of *Hernandia*.

The monocotyledonous plants may in like manner be conveniently divided into *true* and *spurious*. The former have one and the same mode of germinating and growing, and, consequently, the same habit of external form, as the *Gramina*, *Cyperoideæ*, *Lilia*, *Orchides*, *Scitamina*, *Palmae*, &c. The latter agree only in the mode of germinating with one another, and with the former, in their other qualities they differ almost in every point, as *Nelumbium*, *Trapa*, *Ceratophyllum*, *Cuscuta*, *Orobanche*, &c. Hence a plant is generally named monocotyledonous, which arises from the shell of the seed with only one true leaflet, or a single filiform shoot (*turio*), and from its primitive form is either phyllophorous, or turioniferous.

Phyllophorous, or Leaf-bearing, *phyllophora*, sending forth a cotyledonous leaflet from the seed: When this is like the succeeding leaves of the plant, the cotyledons are named homophyllous (*homophyllæ*), as in *Canna*, *Arum*, &c.; when it is different from those, which follow, they are named heterophyllous (*heterophyllæ*), as in *Asarum*, *Paris*, the *Cerealia*, &c.

Turioniferous, or Shoot-bearing, *turionifera*. These are either perpetually aphyllous (*aphyllæ*), and might be called acotyledonous plants, if they did not arise from a manifestly distinct embryo, as in *Cuscuta*, and *Melocactus*; or they are bulbiferous (*bulbiferæ*), when the embryo is first elongated into a fleshy staff, then the outer extremity of it is enlarged into a bulbous globule, and finally from this globule arises

the first leaflet: which likewise is either heterophyllous, as in *Phoenix*, or homophyllous, as in *Bulbine* and most others.*

c. *Dicotyledonous, dicotyledoneum*. These are the most frequent, and cherish within them an embryo separating spontaneously into two lobes, or at least divided by a conspicuous chink in the extremity opposite to the radicle.

Obs. They are for the most part very easily distinguished from the rest, because the cotyledons, in almost all of them, are manifestly distinct from each other; however, in some the diagnosis is attended with difficulty, namely, when the cotyledons at maturity have coalesced into one undivided body; or when in the more minute embryos the chink of the division is so exquisitely small, that it cannot be properly distinguished by a magnifying glass. In the former case, the seed ought to be cut before its full maturity, or the mature nucleus is to be determined and referred to its proper class, according to the signs delivered above, when speaking of the false monocotyledonous seed. In the latter case, it is often useful to throw the doubtful embryo into a coloured liquor, that this may be received within the chink, and thus render it more conspicuous; but if we cannot determine the matter by this means, then the seed is to be referred to the monocotyledonous, even though it has been produced from a genuine dicotyledonous plant.

Dicotyledonous Plants generally arise from the earth with two seminal leaflets; but sometimes they leave their cotyledonous lobes hidden beneath the surface of the earth, and rise with their plumule only into the air; wherefore their Cotyledons are named either epigeal, or hypogeal.

Epigeal, *epigæa*, these cotyledons are always the forerunners of the appearance of the new plant, and either resemble thick herbaceous lobes, as in the *Leguminosæ*, or true leaves, yet, for the most part, different from those, which are to follow, as in the

* Some have thought that there is another new mode of connection between the monocotyledonous and dicotyledonous plants, viz. where from a truly monocotyledonous seed a plant is produced, in every respect, resembling the genuine monocotyledonous ones, except in rising from the earth during germination with two seminal leaflets, and they have asserted that this happens in *Asarum* and *Aristolochia*. I do not deny that a seminal plant of *Asarum* may have appeared with a double cotyledonous leaflet, but I doubt whether those lobules both issued from the shell of the seed at the same moment; and it seems to me more than probable, that one of them was sooner evolved than the other, although, at the end of the evolution, the lobules might seem to be equal and synchronous: any one might form the same opinion with regard to *Nelumbium*, who had observed the end, and not the first beginning of the germination of it; in the seed of this plant I have more than thirty times been gratified by noticing the earlier appearance of one leaflet, and the later of the other. Therefore I think that this opinion requires further confirmation, before it can be admitted as certain. GÄRTN. Präf. Vol. II.

Compositæ, &c., and they spontaneously fall off after the unfolding of the plumule.

Hypogean, *hypogææ*, these are only met with in some exalbuminous seeds, the shell of which they very exactly fill, and never throw it off; they, therefore, always consist of thick and fleshy lobes, and those are either united, as in *Hippocastanum*, &c., or distinct, as in *Juglans*, various *Viciæ*, &c., and, for the most part, even before germination, they cherish a manifest plumule in their bosom, which even alone is capable of evolution.

d. Polycotyledonous, *polycotyledoneum*. These seeds are easily distinguished from the others, by the embryo being divided into more than two lobes.

Obs. BOERHAAVE was, with reason, of opinion that a proper class ought not to be constituted of the polycotyledonous plants, because their number was too small; but we cannot agree with ADANSON, when he asserts that polycotyledonous seeds only differ from dicotyledonous, because their lobes are again deeply divided, and that their lobes are only two; for the unequal number of the lobes, as a ternary and quinary one in some species of *Pinus*, sufficiently refutes this opinion. The cotyledons are found to be more than two in various, but only very few plants, thus they are three, in the *Hemlock Spruce Fir*; four, in *Rhizophora gymnorhiza*, and in *Avicennia*; five, in *Pinus sylvestris*; six, in *Lepidium sativum*, &c.; ten, twelve, or more, in the different species of *Pinus*. In all these the lobes are observed to be perfectly equal, except in *Canarium* and *Lepidium*, and they are also distinct in all, except *Hernandia*, of which the cotyledonous nucleus is solid, and only many-parted internally by indistinct streaks. But polycotyledonous plants do not arise from these seeds alone, but they may arise from acotyledonous seeds, as in *Mnium hygrometricum*, and *Bryum trichodes* and *argenteum*, and various *Fuci*, and it is probable, that even various other more imperfect plants belong to this tribe, which were formerly all referred to the monocotyledonous. Finally, it is to be remarked that true dicotyledonous seeds sometimes may counterfeit the polycotyledonous, namely, when the nucleus, from abundance of nutriment, is divided into various irregular lobes, as in *Mangifera domestica*, or into small bractes not cohering with each other, as in *Citrus decumana*; but this structure is so manifestly monstrous, that it cannot deceive a person even who is slightly versed in these matters.

c. EQUALITY.

Obs. Equality is most scrupulously observed by Nature, between the two or more cotyledons of one seed; yet in some instances a difference does appear, first, of size and thickness, as in *Sitodium*, *Trapa*, &c.; secondly, of size alone in *Lepidium*, &c.; and thirdly, of thickness alone, as in *Cannabis*, various *Asperifoliæ*, &c. But all this difference is abolished by germination, and the evolved cotyledons of the same seed are almost always found to be equal to, and very like each other.

d. THICKNESS.

Obs. The Thickness of the involved Cotyledons may be generally stated to be threefold, viz. foliaceous, compressed, and turgid.

Turgid, *turgidæ*, turgid cotyledons are flat on one side, convex on the other, and, from their particular form, are said to be

Semicylindrical, *semicylindricæ*, as in *Solanum*.

Hemispherical, *hemisphæricæ*, as in *Thymelæa*.

Half-ovate, *dimidiato-ovataæ*, as in *Scytalia*.

Gibbous, *gibbæ*, as in *Lygeum*, &c.

Compressed, *compressæ*, holding the middle place between turgid and foliaceous, flattish on both sides, and not differing much from the foliaceous, except in being less flexible, as in *Sesamum*, *Neurada*, &c.

Foliaceous, *foliaceæ*, very thin, and resembling true leaves, as in *Tilia*, most *Malvaceæ*, &c.

e. MAGNITUDE.

Very large, *maximæ*, which by their bulk, whether large or minute, fill the whole of the shell of the seed, so that, when it is opened, nothing but the cotyledons, and radicle come into view, hence almost all exalbuminous seeds have very large cotyledons, as in the *Compositæ*, *Verticillatæ*, &c.

Middle-sized, *mediocres*, which are nearly of the length or breadth of the cavity of the shell, but do not fill it wholly, on account of the presence of the albumen, as in *Barringtonia*, the *Tricocæ*, &c.

Small, *parvæ*, which are neither half as long as the seed, nor shorter than a fourth part of it, as in the *Umbelliferæ*, *Stellatæ*, &c.

Minute, *minutæ*, smaller than the just mentioned limits, and sometimes scarcely discernible by means of a Glass, as in *Erica*, *Aquilegia*, *Ranunculus*, &c.

f. SITUATION.

Obs. The absolute situation of the cotyledons is supposed to be always in the highest part of the radicle, although this be inverted, or those be turned to the side of the radicle, or rolled about it. But the relative situation respects the situation, which they hold among themselves, or with respect to the external regions of the seed.

Cotyledons, with respect to each other, are

Contiguous, *contiguaæ*, their internal surfaces touching

mutually in every point, as in the *Compositæ*, and by far the greatest number of known plants.

Opposite, *oppositæ*, their internal surfaces mutually respecting each other, but, on account of the inflected margins, either not able to touch each other at all, or not in all points, as in *Geranium pratense*, *Coldenia*, &c.

Collateral, *collaterales*, when one cotyledon is placed at the side of the other in the same vertical plane, so that they can respect or touch each other mutually, only at their internal margins, as in *Viscum*, *Menispermum Cocculus*.*

Diverging, *divergentes*, joined at the base, but taking a contrary direction at the apex, as in *Myristica*, and *Menispermum fenestratum*.

Verticillate, *verticillatæ*, placed in a circle about a common point, so that they mutually touch each other, as in *Pinus* and *Rhizophora*.

Cotyledons, with respect to the external regions of the seed, are

Incumbent, *incumbentes*, when one respects the back, and the other the belly of the seed, so that the plane of mutual contact is parallel with the axis of the fruit or seed, as in *Hyoscyamus*, *Cucubalus*, &c.

Accumbent, *accumbentes*, when one respects the right, and the other the left side of the seed, and the margins are turned to the back and belly of it, so that the plane of contact is contrary to the axis, as in the *Leguminosæ*, &c.

Transverse, *transversales*, which have an oblique, or irregular situation in the seed, as in *Myrsine*, *Lathræa*, &c.

g. SURFACE and MARGIN.

Obs. Almost all Cotyledons have a continuity of substance, and a perfect equality of surface, yet some are found to be incised, &c.

Toothed, *dentatæ*, or serrated at the margin; these are uncommon, and hitherto have been seen in *Tilia* only.

Parted, *partitæ*, their foliaceous plates more or less deeply divided into equal parts, as *bifid* in *Brassica*, *Vella*, &c.; *trifid* in *Canarium* and *Lepidium*, unless these might be more properly referred to the

* And in some measure in *Cachrys*.

polycotyledonous; and *pinnatifid* in *Geranium moschatum*.

Chinky, *rimosa* s. *anfractuosa*, having their thick lobes divided by chinks and deep furrows into various irregular lobes, cohering with each other, and not separated by an intervening membrane, as in *Cacao*, *Fagus*, &c.

Ruminate, *ruminata*, like the preceding, except that the chinks are chiefly placed in the external surface, and separated by intervening membranous plates, as in *Castanea*.

Lobed, *lobata*, when each primary lobe is again divided into other smaller lobes, on the exterior surface only, as in *Juglans*, &c.

Windowed, *fenestrata*, pierced with many round holes, as in *Menispermum fenestratum* only, as far as is hitherto known.

h. FIGURE.

Obs. The figure of the cotyledons is frequently not different from that of the whole embryo, especially in the monocotyledonous, and various other seeds, but in most seeds it is worthy of consideration separately, and either according to the straightness or curvature of the plane of contact, or according to the circumcesure of the Cotyledons.

Straight, *recta*, when the internal surfaces, or plane of mutual contact, as well with respect to their length, as breadth, scarcely deviate from the right line. These are the most frequent, and their proper figure is defined from their thickness and circumference alone.

Bowed, *arcuata*, generally narrow, and always longer than they are broad, the axis also is curved in all, but the breadth of the surfaces is always straight and flat. They are

Reniform, *reniformes*, the nearest to straight, as in *Acajuba*, the *Leguminosa*, &c.

Sickle-shaped, *falcata*, all these, from their situation, are accumbent, as in *Canella*, &c.

Hooked, and Semicircular; *uncinata* & *semicirculares*, all these, from their situation, are incumbent, they describe a greater or smaller arch of a circle, as in the *Alsinacea*, *Lychnidea*, &c. &c.

Cochleate, *cochleata*, which make one or two spiral turns, as in *Cistus*, &c.

Vermicular, *vermiculares*, bowed in an irregular manner, as in *Scorpiurus vermiculata*.

Flexuose, *flexuosæ*, these are all broad, and often even are thick, and have plates, which are straight, when considered with regard to their length, but curved with regard to their breadth, and turned in a contrary direction. To these belong

Keeled, *carinatæ*, of which the axis projects into an angle, but the flattish sides are bent either forwards, or backwards, as in *Ligustrum*, &c.

Converging, or Somewhat conduplicate, *conniventes s. subconduplicatæ*, these from their situation are opposite, and the sides are inflected in such a manner that the half of one plate is received within the duplicature of the other: wherefore they might be called equitant, *equitantes*, as in *Geranium pratense*, and *Coldenia*.

Repand, *repandæ*, the plates of which are curved in contrary directions only near the margin, but in the middle are sufficiently flat, and are marked with a round angle, hence they are named sigmoid (*sigmoidæ*), and undulated (*undulatæ*), as in *Tilia*, *Fagopyrum*, &c.

Plaited, *plicatæ*, plaited like a ruffle into contiguous vertical, or transverse wrinkles, as in *Sebestena*, &c.

Pitted, *lacunosæ*, having their internal surfaces marked with rude and thick folds, as in *Cacao*, *Fagus*, &c.

Volute, *volutæ*, differing from all the preceding, because their foliaceous, and very broad plates are rolled in various ways about a globe, or cylinder, or each other, and curved in all directions. To these are referred

Concave, *concavæ*, or Spoon-shaped (*cochleariformes*), as in *Myristica officinalis*, &c.

Conglobate, *conglobatæ*, formed into a sphere, which is smooth on the outside, but plaited within in various ways, as in *Brassica*, *Sinapi*, &c.

Convolute, *convolutæ*, strictly so called,

1. Cylindrical, *cylindricæ*, simply rolled into a hollow cylinder, as in *Pisonia*, &c.
2. Spiral, *spirales*, the foliaceous plates rolled spirally about the radicle or plumule, as in *Punica*, *Myrobalanus*, &c.

3. Doubly-convolute, *duplicato-convolutæ*, having both margins reflected spirally into the middle of the internal surface, as in *Nelumbo*.
4. Sheathing, *vaginantes*, the outer plate cylindrically convolute, and embracing the internal, doubly-convolute, as in *Aubletia*, *Rivina*, &c.
5. Writhed, or Contortuplicate, *contortuplicatæ*, plaited and convolute in an almost inextricable manner. These from their external form are named cynocephaloid (*cynocephaloideæ*), resembling the head of a hound with pendulous ears, as in *Althæa*, *Malva*, &c.; and chrysaloid (*chrysaloideæ*), resembling an immature butterfly, lying within its chrysalis, as in *Gossypium*, *Convolvulus*, &c.

Obs. The proper figure of the cotyledons, which is defined by the limits of the circumference of the margins alone, and is equally common to the straight and curved cotyledons, has exactly the same modifications, which true leaves have, being, as well as they, linear, lanceolate, oblong, ovate, cordate, &c., except that the margins of cotyledons are very rarely toothed or incised, and scarcely ever irregular. Cotyledons also, like true leaves, have a different form in the different species of one natural genus, thus in *Acer tataricum* the cotyledons are gibbously flexuose; in *A. rubrum*, spiral, &c.; so in *Rumex digynus* they are quite straight; in *R. sanguineus* and *obtusifolius*, slightly curved, &c., &c. But these differences, which are so frequent in leaves, occur very rarely in cotyledons; and it is very common for all the cotyledons of one genus or family, and even of two natural classes, to be very like, and absolutely of the same form, as in the *Umbelliferae*, &c.

i. COLOUR.

Obs. The most frequent colour of involute cotyledons is a pure milky white. Yellow also very often occurs, especially in the mature seeds of *Siliques* and *Legumes*. Nor is a dark or grass-green uncommon, and when, besides this colour, cotyledons have also a foliaceous figure, the seeds are said to be germinating (*germinantia*), as in *Nelumbo*. The other colours, as livid or leaden, are found in the Seeds of *Sonchus* and *Scorzonera*, and also a purplish colour in the seeds of *Bidens*, and *Zinnia*, but they are very unusual. By germination all these colours are converted into green, or sometimes, though more rarely, into blood-colour, as in some *Amaranthi*.

j. ODOUR and TASTE.

Obs. Cotyledons have no odour, or certainly neither a sweet nor aromatic one, and the very fragrant odour of the fruits of *Cinnamomum* & *Caryophyllus* is wholly lost in the mature cotyledons. The taste in some is bitter, in others acrid, but in most is insipid and mealy, or sweetish, as in the fresh kernels of *Amygdalus*, *Avellana*, and *Juglans*.

4. EMBRYO, *embryo*, the most noble and essential part of a fertile seed, which alone forms the new plant, and to which all the other parts are added for its temporary use only. Pl. XI. f. 1. 2. 3. &c.

Obs. It is named Corcle, *corculum*, by CÆSALPINUS, and Seminal Plumule, *plumula seminalis*, by others; but neither of these names exactly suits this part of the nucleus, wherefore we have adopted, in preference, that of Embryo (*embryo*) with ADANSON, because it seems to correspond very well with the form and fate of the part under consideration.

It has been shewn above, that the Embryo derives its origin from the medullary point (*punctum medullare*), produced by fecundation, which perhaps might more properly be named the Corcle of the seed, because in it alone resides the fountain of all vegetable life, and from it alone proceeds the whole vascular system of the embryo. In some cases the Corcle is so little augmented, that even in the mature seed, it is either imperceptible, or appears only like a paler dot, which we name the Cicatrice, and which has nothing of the embryo but the proper life and faculty of germinating; but in others, the medullary point gradually passes into a columnar radicle, which projects above the kernel at its free apex, and at its base grows firmly to the same; and, finally, in others the Corcle, on all sides loose, grows at both its extremities, and from one of them puts forth the radicle, and, from the other, the new organic parts, which are named cotyledon and plumule. Hence arises a fourfold difference of the embryo, from the increase of the Corcle within the seed, viz.

1. Imperfect, *imperfectus*, an embryo, which is merely potential, as being formed from the germinating cicatrice alone.
2. Incomplete, *incompletus*, formed of a simple fixed radicle alone.
3. Perfect, *perfectus*, constructed of a free radicle and plumule.
4. Complete, *completus*, composed of a radicle, cotyledon, and plumule.

The *Consistence* in all is soft and herbaceous, fleshy, except in Rhizophora alone, the radicle of which is converted, at maturity, into an almost woody hardness. The *Internal Fabric* is found to be very simple in all, for it is formed from the medulla alone, surrounded by its proper bark, in the more simple embryos; but in the rest manifest vessels are added, which arise from the lobules of the plumule or cotyledons by an insensible beginning, and being gradually collected into bundles, generally equal in number to those lobules, run through the whole substance of the embryo, and finish in its uttermost radicle. The *External Fabric* is generally owing to three distinct parts, which are peculiar to the embryo, namely, the *Radicle*, *Scape*, and *Plumule*, which will be considered separately hereafter.

a. FIGURE.

Obs. The figure* of the Embryo arises principally from the cotyledons, joined to the radicle, especially in the solid, or true mono-

* The figure of the embryo in the albuminous seeds deserves great attention, and ought not to be disregarded in the exalbuminous. The most frequent form

cotyledonous embryos, which are almost wholly constructed of the cotyledon alone, and not rarely have a peculiar form, not to be met with in others.

The Solid, or true Monocotyledonous Embryo is

Pulley-like, *trachlearis*, consisting of a short cylinder narrowed in the middle, or as if composed of two globules, as in *Commelina*, &c.

Pyramidal, *pyramidalis*, from a broad radical base rising into an acute point, which is either longer, or shorter, or cylindraceo-acuminate.

Fungiform, *fungiformis*, from a narrow radical base, enlarged into a thick head or pileus, as in *Carex*, &c.

Patelliform, *patelliformis*, from a very minute radical tubercle, extenuated into a round saucer, as in *Flagellaria*.

The Dicotyledonous, and the remaining Monocotyledonous embryos are

Straight, *recti*, these are the most frequent, and considered generally, are either thick or foliaceous.

Thick, *crassi*, these scarcely deviate from the straight line, and vary between the filiform and globular form in various ways. Pl. XI. f. 6. d.

Foliaceous, *foliacei*, these are often curved in some

is cylindrical or filiform, sometimes longer, sometimes shorter, and sometimes very short, so as to be almost ovato-oblong. The number of these embryos amongst our genera (1050), excluding all the *Compositifloræ*, is found to be about 336, whence it follows that the number of cylindrical embryos is about equal to one half of the albuminous seeds. Nor is this to be wondered at, since the cylindrical form, besides its simplicity, and the narrow space occupied by it, may be more easily bent than any other into a hook, semicircle, ring, or a spiral form, by which modifications the cylindrical embryos are very frequently affected, since almost a third part (about 103) of our genera have a manifestly crooked embryo. The other forms of the embryo in albuminous seeds, for we are not speaking here of exalbuminous ones, are either globular, or generally oblong. All the globular embryos are very minute, as in *Ranunculi*, *Papavera*, &c., insomuch that they are sometimes with difficulty found by the most experienced, or if found, it is scarcely possible to determine with certainty, whether they belong to the monocotyledonous or dicotyledonous plants, as we have acknowledged concerning the embryos of *Pyrola* and *Begonia*. Hence when we have satisfied ourselves concerning the perfect solidity of an embryo of this kind, or its division into cotyledons, and also of its situation, that is all which we can hope to know of it. The oblong embryos are often equal to the albumen, often also much shorter and narrower, and in that part, where they consist of cotyledons alone are always either lenticulari- or foliaceo-compressed, hence the figure and other affections of them, either depend entirely on the cotyledons, or coincide entirely with these. The figure of the embryo is in general the most constant of its qualities, yet it is sometimes different in the different species of a natural genus, as in *Acer* and *Myristica*, to which may be added the slight difference observable in the embryos of *Rumex*, and the greater difformity of those of *Scorpiurus*. GÆRTN. Præf. Vol. II.

part of them, and may be even flexuose, or spiral, provided the middle axis be straight, and the circumference of the body of the embryo be not curved and anfractuose; hence *Punica*, *Myrobalanus*, &c. ought to be enumerated amongst the straight, although their cotyledons are curved.

Curved, *curvi*, these always deviate from the right line, both at their axis and circumference. Pl. XI. f. 7. c.

They are

Bowed, and **Sickle-shaped**, *arcuati* & *falcati*, the axis describing only a small segment of a circle, and the extremities not mutually approaching, as in *Allium*, *Asparagus*, &c.

Uncinate and cyclical, *uncinati* & *cyclici*, describing more than half a circle, and by their extremities including a round void space, as in *Sagittaria*, *Alisma*, *Potamogeton*, &c., &c.

Conduplicate, *conduplicati*, having the radicle accumbent on the sides or chink of the cotyledons, or having generally the extremities either not at all separated, or separated by a narrow space only, as in *Cannabis*, various *Leguminosæ*, *Siliculosæ*, &c.

Spiral, *spirales*, having their axis rolled into a screw, or in a spiral manner, as in *Allium*, *Salsola*, &c.

Gnomonic, *gnomonici*, or like a dial, having the scape inflected at a right angle, as in *Guetarda*, or having the radicle joined at an obtuse angle with the cotyledons, as in *Persicaria*, *Ruta*, &c.

Serpentine and Sigmoid, *serpentinei* & *sigmoidei*, having the axis bent in a contrary direction near the two extremities, or irregularly curved throughout its whole length, as in *Lilium*, *Tulbagia*, &c.

b. SITUATION.

Obs. The *absolute* situation of the embryo, in general, is such, that the radicle respects the circumference, and the plumule and cotyledons the centre of the seed, except some peripheral embryos, which are, on all sides, equally distant from the centre. The *relative* situation respects either the internal or external parts of the seed, or even the substance of the whole pericarp. In speaking of the situation of the umbilicus and the seed, the two latter relations have been so far considered, that it may be easily understood from thence, that an obverse umbilicus, for example, implies an obverse embryo, and an erect seed an erect embryo, &c. The relation of the situation of the embryo to the other internal parts of the seed, therefore, only remains to be considered.

From this relation Embryos are

Central, *centrales*, which either fill the whole cavity of the shell, or which are placed only in its axis, and within the albumen; as in the *Umbelliferae*, *Compositae*, and in by far the greatest number of other seeds.

Excentric, *excentrici*, which are placed indeed within the albumen, but without the axis of the seed, yet so that they cannot touch the walls of the shell, as in *Asparagus*, *Coffea*, &c.

Peripheral, *peripherici*, which are accumbent on the walls of the shell throughout their whole length, and therefore are placed both without the axis, and without the albumen, as in *Pisonia*, the *Gramina*, &c.

C. MAGNITUDE.

Obs. The size of the embryo admits the four degrees of measure, which are above given to the cotyledons, for as the cotyledons alone define the figure, so generally they define also the size of the embryo; and frequently an embryo, of itself very small, may become very large by the accession of the Cotyledons, as in *Scytalia*. Thus from the bulk alone of the cotyledons; Very large (*maximi*) embryos are almost always found in the *Cucurbitaceae*, *Compositae*, *Verticillatae*, *Asperifoliae*, *Siliquosae*, and *Leguminosae*; Middle-sized (*mediocres*) in the *Tricoceae*, *Solanaceae*, *Dipsaceae*, *Alsinaceae*, &c. Small (*parvi*) in various *Umbelliferae*, *Caprifoliae*, and *Stellatae*; Minute (*minuti*) in most Monocotyledonous plants, as in the *Orchideae*, and *Cyperoideae*, and also in the *Multisiliquosae*, and *Papaverinae*.

D. NUMBER.

Obs. The number is constantly one, except it be increased by superfetation, of which the only known example is in *Pinus Cembra*, in the seed of which two embryos were once observed within the same cavity of the albumen, one of them inverted, the other, as is usual in this genus, erect. In the seed of *Viscum* a plurality of embryos sometimes seems to take place, as appears from the descriptions and engravings of others.

E. PROPER PARTS.

a. Plumule *plumula*, the first bud of the new plant, arising from the scape of the embryo imprisoned in the seed, and ready to pass afterwards into true leaves of the plants. Pl. XI. f 8. c.

Obs. It is not only very constantly wanting in all monocotyledonous seeds, except perhaps a few *Graminae*, but also very frequently in the dicotyledonous ones, or at least is entirely concealed within the scape. These concealed plumules are named immersed (*immersae*). The emerged (*emersae*), on the other hand, are always conspicuous, and

the radicles are placed in the vertex, yet so as to remain between the lobes of the cotyledons, and not to come into view except by removing them from each other, from the narrowness of the place they are always compressed, and have conduplicate leaflets, either simple or compound.

Simple, simplex, a simple plumule has sessile leaflets in opposite pairs, and these are either cylindraceo-acuminate (*tereti-acuminata*), as in *Carthamus*, &c., or lineari-oblong (*lineari-oblonga*), as in *Laurus*; or lanceolate (*lanceolata*), as in *Acanthus*, &c.; or ovato-acuminate (*ovato-acuminata*), as in *Anacardium*, *Corylus*, &c.; or convoluto-peltate (*convoluto-peltata*), as in *Tropæolum*; or finally spiral (*spiralis*), as in *Gyrocarpus Jacquini*.

Compound, composita, supporting more than one leaflet on one common petiole, and those either conjugate, or digitate, or crowded.

Conjugate, conjugata, either two-paired or bijugous (*bijuga*), as in *Arachidna*; or many-paired (*multijuga*), as in *Juglans*, &c.

Digitate, digitata, uncommon, but occurs in *Hippocastanum*, and *Lupinus*.

Heaped together, coacervata, these seem properly to belong to the many-paired, but the leaflets are so closely crowded, and perhaps intermixed with stipules, that, from the minuteness of the parts, they cannot be distinguished from each other, as in *Lathyrus*, *Vicia*, &c.

5. **Scape, scapus,** this is much more frequently wanting than the plumule, and most embryos are absolutely stemless. Yet those may be named caulescent, which have a very long radicle, especially one which grows somewhat thicker downwards, as in *Cestrum*, &c., or in which the cotyledons are separated by a slender stipe from the somewhat swollen capitate radicle, as in *Viscum*, *Berberis*, &c.

But in most cases certain limits between the end of the stem and beginning of the radicle are not given, and a great portion of almost all those scapes, under germination, descends into the earth, and is converted into a true root; wherefore every part of the embryo, placed beneath the cotyledons, may be not improperly enumerated amongst the radicles. The *bulbiparous* Stolons, or Shoots (*turiones*), which proceed from the germinating seeds of *Phœnix*, *Ornithogalum*, &c., and which cannot, before germi-

nation, be distinguished from a true embryo, have a great similitude with the filiform scape of a monocotyledonous embryo. But, since they only arise from the seed at one of their extremities and from this bulbous extremity send forth new leaflets, and new radicles, and at the other remain immersed within the albumen, and together with this are wholly destroyed by the seminal plant, and afford nourishment to it, it is thence manifest, that these Stolons, strictly speaking, ought neither to be referred to the embryo, nor to any part proper to it, but ought to be regarded as a peculiar Viscus, which has a very near affinity with the Vitellus. Pl. XI. f. 8.

- c. Radicle, *radicula*, this is by far the most constant part, not only of the Embryo, but of the whole nucleus, since it is found even in those seeds, which have no other vestige of an embryo. Pl. XI. f. 8. d.

Solitary, *solitaria*, this is almost universally the case..

Three, Four, or Six together, *ternæ, quaternæ, senæ*, radicles of this kind properly formed, and perfectly distinct from each other, are found in the seeds of *Secale, Triticum*, and *Hordeum*, but in no other seeds hitherto known. Pl. XI. f. 5. c.

Obs. The radicle agrees in properties with the embryo, of which it always constitutes a very considerable proper part, hence nothing requires to be separately noticed in it, except its figure, length, and situation.

a. FIGURE.

Puncticular, *puncticularis*, appearing like a mere white point in a nucleus in every other respect solid, as in the *Musci*, and other more imperfect plants. In all other cases the radicle projects.

Tubercular, *tubercularis*, little different from a thicker solid point or dot, as in *Piper, Flagellaria*, &c.

Conical, *conica*, arising from the Cotyledons with a broad base, and ending quickly in a point, as in *Circæa*, many *Cucurbitaceæ*, and *Verticillatæ*.

Roundish, Filiform, or Cylindrical, *teretiuscula, filiformis, aut cylindrica*, as in *Hypericum*, the *Alsina-cææ, Solanaceæ*.

Fusiform, or Club-shaped, *fusiformis aut clavata*, as in *Coffea, Rhizophora* and various *Leguminosæ*.

Capitate, *capitata*, as in *Zamia, Viscum, Berberis*.

Ovato-globular, *ovato-globosa*, as in *Cassya*, &c., and in all minute and globular embryos, as in these the

radicle forms the greatest part of the embryo, as in *Grossularia*, *Drosera*, &c.

Straight, *recta*, most short radicles are of this kind, even in curved embryos.

Curved, *curva*, most long radicles are curved, and of these the most remarkable are *gnomonic*, as in *Guet-tarda*.

β. LENGTH.

Very long, *longissima*, longer than the cotyledons, as in *Rhizophora*, *Anguillaria*, &c.

Equal, *æqualis*, as long as the cotyledons, as in most *Umbelliferæ*, &c.

Short, and Very short, *brevis* & *brevissima*, shorter than the cotyledons; these occur in all the *Monocotyledones*, *Tricocceæ*, *Verticillatæ*, &c.

γ. SITUATION.

Obs. The proper situation always seems to be at the base of the embryo, but the *relative* situation has a reference to the other internal parts of the seed, and especially to the proper receptacle of the fruit and seed.

With respect to the other internal parts of the seed, and especially with regard to the albumen, the situation of the radicle suffers the same modifications exactly, which the embryo itself does, whence radicles are *Central*, *Excentric*, *Peripheral*. But, from their combination with the cotyledons, a new relation arises amongst these parts, and thence the radicle becomes *direct*, &c.

Direct, *directa*, which continues to run out in one line with the axis of the cotyledons, whether it be straight, or curved, and at the base of the cotyledons does not suddenly take any other course, as in the straight, sickle-shaped, hooked, bowed, and cochleate embryos.

Inclined, *inclinata*, the axis of which is joined at a right or obtuse angle with the axis of the cotyledons, as in *Ruta*, *Pentaphyllum*, &c.

Reflected, *reflexa*, which is suddenly recurved near the base of the cotyledons, towards their other extremity, and is either accumbent on their sides or chink; as in the conduplicate embryos, especially of the *Siliculosæ* and *Leguminosæ*.

Involute, *involuta*, constituting the axis of the embryo, about which the cotyledons are so rolled, as to conceal a very large part of the radicle, as in *Ayenia*,

Punica, &c., and in some measure in *Gossypium*, and other contortuplicate embryos.

Obs. With respect to the proper receptacle of the fruit, or seed, which is a relation of situation of very great moment, a radicle is superior, &c.

Superior, or Ascending, *supera* s. *ascendens*, respecting the apex of the fruit with its point. Radicles are named simply *superior* when they tend directly upwards, and rise from the highest part of the seed, as in the *Umbelliferae*, *Asperifoliae*, &c. They are named *ascending*, when they arise from the base or side of the seed, and tend upwards at their apex; as in *Cannabis*, *Corrigiola*, &c.

Inferior, or Descending, *infera* s. *descendens*, respecting the base or peduncle of the fruit with its apex. A radicle is named strictly *inferior*, which, rising from the bottom of the seed, tends directly downwards; as in the *Compositae*, *Verticillatae*, &c. And *descending*, which, rising from the highest part of the embryo, tends towards the base with its apex, as in *Meesia*, *Mirabilis*, &c.

Centripetal, *centripeta*, either absolutely, or relatively such. The former, in a simple fruit, respect the axis, or common receptacle of the seed with their apex, as in *Tulipa*, *Nicotiana*, &c. The latter, in a conjugate, or many-capsuled fruit, are turned indeed to the common axis, but in partial pericarps only respect the internal side; as in *Helicteres*, *Aconitum*, *Delphinium*, &c.

Centrifugal, *centrifuga*.—These are

Unilateral, or One-sided, *unilaterales*, all respecting one side of the pericarp, or, in a naked seed, the circumference of its horizontal plane, as in *Beta*, *Chenopodium*, &c.

Bilateral, or Two-sided, *bilaterales*, turned to two directly opposite regions of the pericarp, as in *Menyanthes*, the *Siliquosae*, &c.

Multilateral, or Many-sided, *multilaterales*, directing their points to different places, or to every surface of the dissepiments and internal parietes, as in *Helianthemum*, the *Cucurbitaceae*, &c.

Vague, *vagae*, which have not the same certain situation in all seeds, but are directed with their points towards different parts; as in *Zingiber*, *Nymphaea*, &c.

Obs. These various directions of the radicles, in fruits and cells, which have only one or two seeds, are to be very strictly taken, and from

these the proper situation of the seed within the pericarp is to be defined. But, in the many-seeded, there is no occasion for such nicety, for in these it is more convenient to attend to the situation of the common receptacle of the seeds, and from this alone to define the situation of the seeds, because, at the maturity of the fruits, the natural position of the radicle is often changed, and the situation of the receptacle is generally more constant, and more easily investigated, than that of the radicle. Hence to *centripetal* we refer the seeds of *Erica*, *Ruta*, &c., although their radicles are superior; of *Anagallis*, &c., although they have inferior radicles; and of *Colchicum*, &c. although their radicles respect the circumference: On the contrary, we refer to *centrifugal* the seeds of *Grossularia*, notwithstanding their radicles are manifestly centripetal; and, in general, in all many-seeded cells we prefer the evident situation of the receptacle, to the less conspicuous, or difficultly discovered position of the radicle. For the most part, however, even in the many-seeded fruits, the situation of the radicle and receptacle corresponds, and the general rule, which is founded in the situation alone of the radicle, only suffers few exceptions.

Thus variously modified, the embryo is imprisoned within its seed, and remains in a profound sleep, till it is awaked by the approaching germination, and by its inherent powers grows into a new plant. In the state even of involution it possesses life, though not yet active, nor, with respect to duration, equal in all. For some seeds, in a short time, lose their vegetative virtue, and, unless they be committed to the earth, immediately after their maturity, scarcely ever germinate, as those of *Angelica*, *Thea*, *Coffea*, &c. Others, on the contrary, continue alive, and capable of vegetation, during the space of twenty or even forty years, as those of *Mimosa*, and various *Leguminosæ*, or, if report may be credited, the seeds of *Secale*, kept one hundred and forty years, have been found to germinate. But the ordinary, and usual term of the life of the Embryo seems to be confined within four or eight years, yet may be variously protracted, or diminished by a proper or improper mode of preserving them, according to the peculiar nature of each species, and to the various nature and quantity of the juices, especially the oil contained in the cotyledons or albumen.

Seeds, which become in a short time incapable of vegetating, if exposed to the air, have been known to retain their fertility for a very great number of years, when they have been buried deep in the earth, either by design or accident. Hence the general rule, for preserving seeds, is to exclude the access of air, and especially warm and moist air, by covering them and keeping them in a cold dry place. Moreover, different modes may be adopted according to the nature of the seed, and our views in keeping them; those seeds, for example, which are preserved for food, or destined to be committed to the earth at the approaching season, need only to be kept in a dry cool place, and to be left within their pericarps, when these are not too succulent: But those, which are to be sent abroad, may be wrapped up in waxed paper, or enclosed in small boxes filled with sand; and, finally, those which are kept for curiosity, should be put into a Glass Vial, with a little sulphur vivum or camphor, and well corked.

As the life of the embryo has its limits, and various artifices are employed for preserving it; so also the evolution or germination has its time, and various methods are found to excite and promote it. Thus some seeds germinate very quickly, and, within the space of twenty-four hours, put forth their first leaflets, as those of *Milium*: Others, and indeed most seeds, produce their offspring within a week, as

those of the *Siliquosæ*, *Compositæ*, *Leguminosæ*; Others, towards the end of the first month, as those of various *Verticillatæ*, and *Umbellifera*; Others after an intire year, as the seeds of *Melampyrum*, *Castanea*, &c.: And others not till the end of two years, as the seeds of *Corylus*, *Cornus*, *Rosa*, &c. Yet these limits are not so fixed, but they may be much accelerated, or retarded. The more early appearance of the new plant depends very much upon heat, and the mildness of the climate and seasons, and also upon the nature of the soil, in which the seeds are placed; yet it is in general confirmed by experience, that the seeds of herbaceous plants germinate more quickly than those of woody plants, and that older seeds, if not always, yet in general, germinate more slowly than recent ones.

The means, employed to promote germination, are of two kinds, first, such as are applied to the seeds themselves; secondly, such as are applied to the soil, to which the seeds are committed. The former, if not always injurious, are for the most part dangerous, because they supply the embryo with a greater quantity of nutriment, than is useful to it, or apply too much moisture to the integuments of the seed; or because a proper agreement betwixt the condition of the macerated seed and that of the earth, and weather cannot always be obtained. Hence a very slow absorption of a simple watery moisture is preferable to all these macerations; and it is not adviseable to file the harder putamens, but rather, as Miller directs, to put them between two tiles, with a sufficient quantity of earth, and place them in a fresh Hotbed, that they may open spontaneously. The latter means, which consist in the preparation of the earth, are not to be contemned, for they are of considerable importance, if they be accommodated to the proper nature of the different species of seeds. But neither these, nor the various circumstances to be observed in the Sowing of seeds, properly belong to Carpology, and it is sufficient to have just made mention of them.

METHOD OF DISSECTING SEEDS.

The general rule is to throw all seeds, even the most recent, into warm water, and first of all to free those of their integuments, which have hard ones, and such as deny a free access to water. When the seeds have been somewhat softened, one of them is to be taken out of the water, and first divided into two equal parts by a transverse section, made from the belly to the back and the divided portions are to be again instantly thrown into water, that the plane of the section may freely imbibe it. Afterwards this softened plane is to be examined by a lens of moderate magnifying power, by which means a threefold difference is generally detected: For first, the plane is manifestly divided, from one wall of the seed to the other, by a simple transverse chink containing no matter of a different colour within it: Or secondly, the plane is marked with a shorter transverse chink, or a roundish areola, in both which a foreign and different-coloured matter appears, and in this case the seed is safely pronounced to be albuminous, and to contain an embryo longer than half the albumen: Or thirdly, no ves-

tige whatever of a chink or areola can be detected, but the plane appears every where uniform and homogeneous; and then we may be very certain that either a very large false-monocotyledonous embryo constitutes the whole nucleus of the seed, as in *Paullinia*; or that a minute embryo must remain somewhere in the albumen, and either in the superior or inferior segment of the divided seed. In this last case, which is by far the most frequent, a new section is to be made in another seed, which will divide it according to its axis into two equal parts. The segments being again thrown into water, are to be treated in the same manner exactly, as the transverse segments; by this means the embryo, unless it be extremely minute, may easily be detected in one of the extremities, or the back of the seed, either in the form of a more or less short cylinder, or of a snowy or green globule; and, if the section be rightly made, it sometimes falls spontaneously out of its cavity, and sinks to the bottom of the water. This very simple process is alone sufficient to detect, and afterwards entirely denude the embryo, in by far the greatest number of seeds: but when a seed occurs, possessing a cartilaginous albumen, and a very minute embryo, as in *Asarum*, then the examination is to be conducted in a different manner. In this case, at that extremity of the seed, where we suspect the embryo to be situated, thin plates are to be repeatedly and carefully cut away from the dorsal and ventral part of the albumen, till only the middle very thin plate remains, which is then to be put into water, or oil of turpentine, till it becomes pellucid like glass. By these means, unless the seed be barren, which indeed often happens, the embryo will be detected by a good lens, of the form of a snowy medullary point, which, from its whiteness, is not easily distinguished from the albumen. It is not easy to describe in what manner very minute embryos of this kind are to be freed from their albumen, that they may be further examined by themselves: this is to be left to the dexterity of each person. But whether we are desirous of examining seeds, with a view to scrutinize the albumen and embryo, or on any other account, we ought always to remember that they should be thrown into water, and detained there some time, however fresh they are; for, without this preparation, it can never be learnt, for example, whether they are gelatinous or not, because this quality, even in the most recent dry seed, cannot be detected by the eye; and it can never be known in old seeds, whether they have formerly been berried or not, because the fleshy pellicle, except in moistened seeds cannot be properly distinguished: not to say any thing of the greater tractability of the moistened albumen, and of the less degree of brittleness of the softened embryo.

METHODICAL DISPOSITION OF PLANTS FROM THE FRUIT.

It is sufficiently ascertained, that the Key of a natural method of plants neither consists in the Corcle of the seed, as some have thought, nor in any other part of the fruit or fructification, and that it is not even given any where, because the organization of vegetable matter undergoes so many different modifications, and the combinations of these modifications are again so numerous, that the affinity of plants cannot by any means flow from one and the same fountain, and that the genera cannot mutually succeed one another in a direct and continuous series, but rather, like tracts and provinces in a geographical map, ought to be placed near each other, and sometimes should be absolutely separated from the neighbouring ones, like islands; as is clearly shewn in the Classes, or highest genera of plants from the Seed, since we observe acotyledonous plants sometimes entering the territory of the polycotyledonous, and monocotyledonous not uncommonly entering that of the dicotyledonous, and in this manner both forming peculiar states in the dominions of others.

Nevertheless very close partial bonds of affinity often arise amongst plants from the flower, and especially from the fruit, and various natural families are given, of which the essential character is evidently founded in the fruit, and is often more widely diffused, or more constant in this, than in the flower itself. Thus the *Leguminosæ*, and *Siliculosæ*,* do not so easily desert the type of their family in the fruit as in the flower. All the *Malvæ* agree

* LINNÆUS has, in some measure, confessed, that the genera of this order cannot be absolutely established from the flower alone, hence he has called the fruits to his assistance in almost every instance, and, in the editions of his *Systema Vegetabilium*, has formed the essential characters of the genera, almost only from the fruit. But, since he has regarded only their ruder structure, and has, at the same time, mixed with his characters signs taken secretly from the flowers, and has given the preference to them, most of his genera are ill founded, as *Myagrum*, *Alyssum*, *Cochlearia*, *Raphanus*, *Bunias*, &c. And there is such confusion amongst the species, and so great difficulty in distinguishing them, that, concerning many of them, no reason can be given, why they are referred to this, rather than any other genus, except the pleasure of the author alone; whence it is demonstrated, that, in this order, neither the flowers, nor the ruder structure alone of the fruits, are sufficient to establish proper genera. But let us follow the steps of the immortal *TOURNEFORT*, and add to the ruder fabric of the fruits an accurate scrutiny of the inmost parts of the seed, and it will immediately appear, how certain and fixed the limits of the genera will become, and how easily and spontaneously the species will arrange themselves under their proper standards, inso-much that it will no longer be difficult for a mere novice to investigate and distinguish them. GÆRTN. Præf. Vol. II.

in their contortuplicate cotyledons, and their membranous-mealy albumen, and admit into their society *Ipomoea* and *Convolvulus*, though unallied to them by their flower. The *Tricoccæ*, by the situation and form of the embryo, and by the peculiar consistence of their albumen are connected together, and do not refuse the alliance of *Parietaria* and *Urtica*. The *Palmae*, which perplex the Anthologists, are easily separated from the neighbouring plants by the hollow or ruminant albumen, and the monocotyledonous embryo, covered with a proper crustaceous pimple. The *Gramina*, by their cotyledonous shield alone, are very distinct from all known plants. The *Umbelliferae*, by their geminate inferior inverted seeds, which hang from an intermediate axis, are abundantly different from others. The *Orchideae*, *Cucurbitaceae*, *Asperifoliae*, *Solanaceae*, *Lychnideae*, and others, always bear manifest marks of their respective families in their fruit, by which not only each of their genera are connected, but a nearer or more distant connection between each of the orders is defined. In determining, therefore, the natural affinity of genera or families, the fabric of the fruits is always to be kept in view; for although an universal bond amongst plants, or a natural method cannot be made out from it, yet new partial connections may be detected from it, and those, which are known from other circumstances, may be more closely drawn.

The affinities of the species, from whence the genera are formed, require a still more accurate scrutiny of the fruit, because, whilst the fruit is unknown, the character of the genus is incomplete, and its true limits uncertain, however definite it may be in other respects. Hence the fruits are commonly received amongst the natural characters of the genera, yet in such a way, that the first importance is always given to the flower, and nothing is attended to, in the whole conformation of the fruits, except the form of the pericarp and cells, and the number of the valves and seeds.*

* Linnæus has declared that the flower ought to be much preferred to the fruit in determining the genera, and, agreeably to this erroneous opinion, he has many times adulterated his genera by the admixture of species, which are very foreign to them. Most of his characters of fruits are drawn, not from nature, but from the figures of *Tournefort*, *Plumier*, &c., the errors of whom he has thus adopted and sometimes increased; and, where such plates were wanting, he has often described the fruits so negligently, as in *Coldenia*, *Eriocaulon*, *Scoparia*, *Cephalanthus*, *Nauclea*, *Trollius*, &c., that we have the clearest testimony of his great contempt of them. Others consider a knowledge of the fruits as the most necessary, and think that the internal structure of the parts ought to be carefully attended to. Some of these botanists attribute much greater dignity to certain parts of the fruit, in defining the characters of the genera, orders, or classes, than seems to be confirmed and approved by Nature.

The middle way between these contrary opinions will, to unprejudiced persons, appear the safest. For Nature has made flowers and fruits equal in dignity, and has given to each their particular characters, so that, from these, the similar may be joined to the similar, and the dissimilar safely separated from each other; but

These signs may sometimes be sufficient, especially when a mere superficial knowledge of plants, intended for the first rudiments, or for reducing an herbarium into order, is aimed at; but, when a more intimate and scientific knowledge of plants is required, by which their natural connection may be estimated, and fixed limits ascertained from a correspondence of their essential parts, we cannot safely confine ourselves to the consideration of the flower, or the surface alone of the parts of the fruit; we ought to proceed to the most intimate recesses of the seed; because characteristic marks are frequently inherent in the internal parts of fruits, which are sought for in vain in the external parts, and, these being neglected or contemned, not only the limits of the genera are obscure, and precarious, but even false species become mixed with the true ones. Thus it is particularly proper to attend to the internal structure of the fruits in the *Siliquosæ*, the genera of which are more safely determined from the fruit, than from the calyx, or glands of the receptacle. In the polyandrous plants with a calyx and berried fruit, we ought to attend to the interior parts of the fruit, unless we wish to associate *Pyrus* with *Mespilus*, and separate the latter without reason from *Cratægus*; unless we wish to confound *Myrtus*, *Syzygium*, *Jambolifera*, *Greggia*, *Caryophyllus*, *Eugenia*, together in one genus. Likewise in the *Portulacæ*, *Falappæ*, *Capparides*, &c., the internal parts of the fruit are of great importance, and in many particular genera, the essential character is inscribed on the embryo, or internal fabric of the seed, as in *Nelumbo*, *Menispermum*, *Tilia*, &c.: whence it is sufficiently apparent, that often the safest diagnostic signs of the genera, are placed in the inmost recesses of the fruits, and that they, on this account also, deserve to be brought to light, because, after the fall of the flower, they may lead to a certain knowledge of the plant.

In the selection of these signs care is to be taken, lest too much

these distinctive signs, could not be every where equally dispensed betwixt flowers and fruits; for the former, from their composition and conformation, are susceptible of a much greater number of modifications than fruits; and fruits, on the other hand, possess greater constancy and immutability of their essential parts; whence it follows, that the diagnostic Signs of the genera, ought generally to be formed from the flower and fruit collectively, that those, taken from the flower, ought especially to be more numerous, and those, taken from the fruit, regarded as more certain and constant. The preference ought certainly to be given to the flowers in all those cases, where certain diagnostic signs cannot be obtained from the fruits, on account of their great conformity, as in the *Gramina*, *Verticillatæ*, &c.; and to the fruits in all those cases, where their internal fabric affords certain constant characters, arising, as it were, from the medullium of plants, as in the *Umbelliferæ*, *Curcubitacæ*, *Siliquosæ*, &c.

But in forming a methodical distribution of Plants, the flower, in other respects, ought to be preferred, since experience has taught, that from thence combinations, both more convenient, and more agreeable to nature, may be formed, than if such a method were taken from the fruit alone. G. Præf. Vol. II. P. 4. &c.

weight be ascribed to differences, which are accidental, or of less moment, and lest the genera be unnecessarily multiplied. It is difficult to prescribe rules for this, which are certain, and applicable in every instance, because the same difference of form or fabric may be, in one family, of great, and, in every other, of no importance; wherefore the value of those signs depends solely upon practical judgement. However, it may be asserted generally, that some parts or modifications of fruits, deserve less or even no attention, and others greater or even the chief attention, in constituting the genera. To the former are referred the *consistence* of the pericarp, common receptacle, and albumen, the *number* of the cells, valves, and seeds, the *magnitude* and thickness of the embryo, the *curvatures* and slighter plaits of the cotyledons; and finally the *absence* or *presence* of the plumule, for all these may be different in the different species of one genus. Amongst the latter are enumerated the

Situation of the parts, as of the pericarp, cells, receptacle, and radicle of the embryo, for those plants, which differ in the situation of these parts, ought to be considered as differing in genus, even though they be alike in every other respect.

Form of the receptacle of the seeds, definite or indefinite, thus *Jussiaea* differs from *Ludwigia*, *Papaver* from *Argemone*, &c., &c.

Aril, and *Berried Shell*, hence *Coffea* differs from *Pavetta*, &c.

Albumen very thick or none, hence *Nageja* is distinct from *Myrica*.

Embryo straight, or remarkably curved, hence *Persicaria* is distinct from *Polygonum*, *Oxyria* from *Rumex*, &c.

Cotyledons differing remarkably in form, hence we do not with ADANSON refer *Lupulus* to *Cannabis*, or *Paullinia* to *Cardiospermum*.

But whencesoever these signs are taken, they are always to be compared with others, and especially the parts of the flower, and are to be added to these, when the natural character of the whole plant is considered; but when the fruit alone is treated of, and is regarded as an organic body standing alone, then the signs are to be taken from its proper fabric alone, these are to be compared together, and genera are to be formed from consimilar species. Such genera may be named *Carpological*, and, like the *Anthological* ones, formed from the flower alone, ought to be regarded as merely artificial, although they often correspond with the natural genera.

An arrangement of the genera, which is taken from determinate parts of fruits, and formed according to certain laws, is named a Method of Plants from the Fruit, and is especially *mixed*, if the structure of the flower be also attended to, *pure* when the principles of the universal distribution flow from the fruit alone. Methods of the former kind contribute more to the knowledge of plants, than fruits, because only the superior genera are usually taken from some parts of the fruit, and the inferior from the flowers, leaves, or habit of the plants. Such methods have been proposed by CÆSALPINUS, RAY, KNAUT, BOERHAAVE, and others. But arrangements of the latter kind are of very great utility in distinguishing fruits, and not to be banished from *Carpology*. ADANSON, has given various schemes of them, taken from different and almost all parts of the fruit, and it would be very easy to adduce several other syntheseses of plants formed upon this plan, but I shall only exhibit one Scheme.

*A Methodical Synthesis of Plants from the SITUATION, FORM, CONSISTENCE, and NUMBER of the Parts of Fruits.**

ACOTYLEDONES.

Chara.
Ruppia.
Zannichellia.
Zostera.
Zamia.
* * *

Aphyteja?

MONOCOTYLEDONES.

FRUIT SUPERIOR.

Exalbuminous.†

Triglochin.
Potamogeton.
Alisma.
Sagittaria.
Butomus.

Albuminous.

Embryo exterior, or not included.

GRAMINA.
Flagellaria.
Nymphæa.

Embryo excentric, or lateral.

* Gærtner has established and enumerated 1054 genera, of which 123 are *monocotyledonous*; more than 920 *dicotyledonous*; scarcely 5 *polycotyledonous*; and about 6 *acotyledonous*, and he thinks it may be learnt from thence with the utmost certainty, that there is an astonishing disproportion in the number of genera in these classes, although, with respect to the whole number of known plants, the computation can not be perfect on account of the unequal and incomplete state of his collection. He is further of opinion, that the *dicotyledonous* and *polycotyledonous* plants might be conjoined without impropriety, but that this could not be done equally well in *Carpology*. PRÆF. Vol. II.

† Out of 1054 genera, Gærtner has found the seeds of 418 certainly *exalbuminous*, 600 certainly *albuminous*, and 36 doubtful, and is of opinion that, if we take the whole number of seeds, the *albuminous* ones far exceed the *exalbuminous*. IBID.

Caranda.
 Licuala.
 Sagus.
 Phœnix.
 Euterpe.
 Bactris.
 Caryota.
 Chamæripes.
 * * *

Commelina.
 Tradescantia.
 Asparagus.

Embryo central :

Radicle contrary to the umbilicus,
superior.

Hyphæne.
 Hyophorbe.
 Cleophora.

inferior.

Smilax.
 Ruscus.

centrifugal.

Aletris.
 Colchicum.

Radicle conterminous to the umb.
superior.

Eriocaulon.
 Wachendorfia.
 Sparganium ?

inferior.

CYPEROIDEÆ.

Typha.
 Hippuris.
 * * *

Coccos.
 Manicaria?
 Elæis.
 Corypha.
 Areca.

Calamus.
 Lontarus.
 * * *

Curculigo.
 Asphodelus.
 Allium.
 Tulbagia.

Calla.

Juncoides. M.
centripetal.

Acorus ?
 Philodrum.
 Dioscorea.

* * *

Ornithogalum.
 Cyanella.

Anthericum.
 Hyacinthus.
 Aloë.

Fritillaria.

Tulipa.

Lilium.

Hemerocallis.

Crinum.

Juncus.

Chlamydia.

* * *

Gloriosa.

Colchicum.

Veratrum.

* * *

Nepenthes.

* * *

Convallaria.

Dracæna.

Paris.

Yucca.

centrifugal.

Arum.

Xyris.

Butomus.

vague.

Nymphæa.

HETEROCLITÆ.

Nelumbo.

SPURIE.

Taxus.

Cuscuta.

Mangostana.

Pyrola ?

Petiveria.

FRUIT INFERIOR.

Radicle inferior.

Trichopus.
 Radicle superior.
 Rajania.
 Radicle centripetal.
 Canna.
 Alpinia.
 Heliconia.
 * * *
 Iris.
 Moræa.
 Gladiolus.
 Bermudiana.
 Ixia.
 Hypoxis.
 * * *
 Alstroemeria.
 Bulbine.
 * * *
 Hæmanthus.
 * * *
 Asarum.
 Aristolochia.
 Radicle centrifugal.
 Tacca.
 Serapias.
 Epidendrum.
 Stratiotes.
 Radicle vague.
 Zingiber.
 Musa.
 Ananas.
 Vanilla.

HETEROCLITÆ.

Trapa.

SPURIAE.

Lonicera.
 Embryopteris
 Barringtonia.
 Melocactus.
 Begonia?

DICOTYLEDONES.

FRUIT INFERIOR.

RADICLE INFERIOR.

ONE-FRUITED.

Exalbuminous.

rectembryous.

gymnospermous.

COMPOSITIFLORÆ.

LIGULATE.

I. Seeds uniform.

A. Pappus none.

a. *Thalamus* naked.

Lapsana.

Rhagadiolus.

Arnoseris.

b. *Thalamus* chaffy.

Scolymus.

B. Pappus leafy.

Catananche.

Cichorium.

C. Pappus capillary.

a. sessile.

Zacintha.

Prenanthes.

Sonchus.

Hieracium.

Troximum.

Andryala.

b. stipitate.

Lactuca.

Chondrilla.

Leontodon.

Crepis.

D. Pappus feathery.

a. *Thalamus* naked.

Virea.

Picris.

Scorzonera.

* * *

Helmintia.

Tragopogon.

b. *Thalamus* chaffy.

Seriola.

Achyrophorus.

II. Seeds difform.

Rothia.

Tolpis.

Hyoseris.

Hedypnois.

Hypochaeris.

Geropogon.

CAPITATE.

I. Congregate.

A. Pappus none

Carthamus.

Calcitrapa.

B. Pappus setaceous.

Onopordum.

Carduus.

Silybum.

* * *

Lappa.

Serratula.

Onobroma.

Atractylis.

Cyanus.

C. Pappus feathery.

Cirsium.

Carlina.

D. Pappus thorny.

Cnicus.

II. Segregate.

Echinops.

Gundelia.

DISCOID.

I. Congregate.

A. Pappus none.

a. *Thalamus* naked.

Artemisia.

Carpesium.

Cotula.

* * *

Micropus.

Ethulia.

Hippia.

b. *Thal.* chaffy or villous.

Santolina.

Gnaphalium.

Tarchonanthus.

* * *

Absinthium.

Evax.

Iva.

Clibadium.

B. Pappus cotyloid.

a. *Thalamus* naked.

Sparganophorus,

Tanacetum.

b. *Thalamus* chaffy.

Lonas.

Anacyclus.

C. Pappus leafy or chaffy.

a. *Thalamus* naked.

Ageratum.

b. *Thalamus* chaffy.

Athanasia.

Xeranthemum.

D. Pap. capil. or setaceous.

a. *Thalamus* naked.

Cacalia.

Senecio.

Eupatorium.

Suprago.

Chrysocoma.

Elichrysum.

* * *

Filago.

Baccharis.

Conyza.

Petasites

b. *Thal.* villous, or chaffy.

Anaxeton.

Pteronia.

Calea.

E. Pap. feath. or pencilled.

Sergilus.

Antennaria.

Argyrocome.

Critonia.

Stæhelina.

F. Pappus awned.

Bidens.

Spilanthus.

II. Segregate.

Sphæranthus.

Elephantopus.

Trinacte.

Stoebe.

Seriphium.

III. Separate.

Ambrosia.

Xanthium.

RADIATE.

- I. Congregate.
- A. Pappus none.
- a. *Thalamus* naked.
- Bellis.
- Matricaria.
- Chrysanthemum.
- Unxia.
- * * *
- Calendula.
- Lancisia.
- * * *
- Milleria.
- Osteospermum.
- b. *Thal.* villous or chaffy.
- Sigesbeckia.
- Phaethusa.
- Achillea.
- Chamæmelum.
- * * *
- Gorteria.
- Sclerocarpus.
- * * *
- Eriocephalus.
- Polymnia.
- Parthenium.
- B. Pappus cotyloid.
- a. *Thalamus* naked.
- Pyrethrum.
- b. *Thalamus* alveolate.
- Favonium.
- c. *Thalamus* chaffy.
- Leysera.
- Anthemis.
- Buphthalmum.
- Wedelia.
- * * *
- Rudbeckia.
- * * *
- Melampodium.
- Chrysogonum.
- C. Pappus leafy.
- a. *Thalamus* naked.
- Tagetes.
- Helenia.
- b. *Thalamus* alveolate.
- Arctotis.
- Apuleja.
- c. *Thalamus* chaffy.
- Eclopes.
- Eclipta.
- * * *
- Osmites.
- Helianthus.
- * * *
- Baltimora.
- Silphium.
- D. Pap. capil. or setaceous.
- a. *Thalamus* naked.
- Jacobæa.
- Cineraria.
- Tussilago.
- Solidago.
- Erigeron.
- Aster.
- Inula.
- b. *Thal.* villous, or chaffy.
- Perdicium.
- Arnica.
- Tridax.
- * * *
- Gazania.
- Zoegea.
- * * *
- Othonna.
- E. Pappus feathery.
- a. *Thalamus* naked.
- Senecillis.
- Mutisia.
- b. *Thal.* alveolate or chaffy.
- Cuspidia.
- Cirsellium.
- F. Pappus awned.
- a. *Thalamus* naked.
- Pectis.
- Synedrella.
- b. *Thalamus* chaffy.
- Verbesina.
- Coreopsis.
- G. Pap. difform, or compd.
- Doronicum.
- Zinnia.
- Amellus.

Barnadesia.

Asteropterus.

Bellium.

Pulicaria.

Ursinia.

II. Segregate.

Disparago.

Oedera.

angiospermous.

Syzygium.

Circæa.

Mespilus.

Pyrus.

curvembryous.

Memecylon.

Albuminous.

rectembryous.

gymnospermous.

Opercularia.

angiospermous.

unilocular.

Athecia.

Embryopteris.

bilocular.

entire.

Spermacoce.

Sarissus.

Pavetta.

Ixora.

Coffea.

Lobelia.

two-partible.

Diodia.

Knoxia.

Phyllis.

Psychotria.

Grumilea.

three or more-celled.

Trixis.

Phylica.

Halesia.

Morinda.

Nenax.

curvembryous.

Ceratocarpus.

Salicornia.

Boerhavia

Mirabilis.

Pisonia?

* * *

Pavetta.

Ixora.

Coffea.

Spermacoce.

TWO OR MANY-FRUITED.

Crucianella.

Sherardia.

Galium.

Richardia.

RADICLE SUPERIOR.

ONE-FRUITED.

Exalbuminous.

rectembryous.

gymnospermous

Valeriana.

Fedia.

Combretum.

angiospermous.

Corylus.

Carpinus.

Juglans.

Quercus.

Fagus.

Castanea.

* * *

Trapa.

Evodia.

Caryophyllus.

Pimpinella.

Sicyos.

Metrosideros.

curvembryous.

Catappa.

Badamia.

Myrobalanus.

Gaura.

Grielum.

Nelitris.

Myrtus.

Greggia.

Albuminous.

rectembryous.

- gymnospermous.
 Scabiosa.
 Knautia.
 Dipsacus.
 Corymbium?
 Thesium.
 angiospermous.
 one-celled.
 Lonicera.
 Barringtonia.
 Viscum.
 Viburnum.
 Psydrax.
 Sambucus.
 Triosteum.
 Adoxa.
 Caprifolium.
 two-celled.
 Chiococca.
 Nertera.
 Cornus.
 three or more-celled.
 Cercodia.
 Hedera.
 Erithalis.
 curvembryous.
 Ditoca.
 Scleranthus.
 Salsola.
 Ficus.
 Tetragonia.
 TWO OR MANY-FRUITED.
 UMBELLIFERÆ.
 Cephalanthus.
 CENTRIPETAL.
 Exalbuminous.
 rectembryous.
 Rhipsalis.
 Metrosideros.
 Melaleuca.
 Epilobium.
 Onagra.
 Ludwigia.
 Jussiaea.
 Leptospermum.
 Fabricia.
- Gustavia.*
 * * *
Syzygium.
Jambolifera.
Caryophyllus.
 curvembryous.
 Cactus.
 Myrtus.
 Melastoma.
 Osbeckia.
 Neurada.
 Albuminous.
 rectembryous:
 opening with a pore.
 Jungia.
 Heuchera.
 Hydrangea.
 Gesnera.
 Roëlla.
 Jasione.
 Phyteuma.
 Trachelium.
 Campanula.
 cut round,
 Sphenoclea.
 valved.
 Samolus.
 Oldenlandia.
 Hedyotis.
 Rapuntium.
 Portlandia.
 Begonia.
 Bæckeæ.
 Philadelphus.
 Montinia.
 * * *
 Chrysosplenium.
 unopened.
 entire.
 Randia.
 Gardenia.
 Mussaenda.
 Tarenna.
 Vaccinium.
 Brunia.
 two-partible.

Cinchona.
Nauclea.
curvembryous.

Mesembryanthemum.

RAD. CENTRIFUGAL.

Bryonia.

Cucumis.

Cucurbita.

Momordica.

* * *

Datisca.

Grossularia.

Greggia.

Guettarda.

Jambolifera.

RAD. VAGUE.

Pella.

Guajava.

Punica.

Aphyteja.

DICOTYLEDONOUS.

FRUIT SUPERIOR.

RADICLE INFERIOR.

ONE-FRUITED.

Exalbuminous.

rectembryous.

caps. or nucamentaceous.

Salix.

Ceratophyllum.

Ventilago.

Protea.

Banksia.

Gelonium.

Paullinia.

drupaceous.

Calophyllum.

Zizyphus.

Paliurus.

Tectona.

Lantana.

Gmelina.

Premna.

Vitex.

Spondias.

berried.

apyrenous?

Hippophae.

Jasminum.

Melicocca.

Scytalia.

Bassia.

pyreniferous.

Volkameria.

Citharexylon.

Clerodendrum.

Ovieda.

Duranta.

curvembryous.

Gyrocarpus.

Acajuba.

Mangifera.

Alectryon.

* * *

Basella.

Anabasis.

* * *

Justicia.

Dianthera.

Cakile.

Albuminous.

rectembryous.

capsular or nucament:

Taxus?

Statice.

Mitella.

Chrysosplenium.

Delima.

Bocconia.

* * *

Plantago.

Scabrita.

* * *

Loeselia.

Phlox.

Roridula.

* * *

Rhamnus.

Euonymus.

Ceanothus.

* * *

Melochia

Commersonia.
 Tilia.
 Swietenia.
 drupaceous.
 Elæocarpus.
 Elæodendrum.
 Microcos.
 Ganitrus.
 berried.
 one-seeded.
 Myristica.
 Mimulus.
 Phlebolithis.
 two-seeded.
 Berberis.
 Nyctanthes.
 three or many-seeded.
 Empetrum.
 Vitis.
 Callicarpa.
 Aquilicia.
 Sapota.
 pyreniferous.
 Tournefortia.
 Grewia.
 curvembryous.
 gymnospermous.
 Blitum.
 Atriplex.
 Spinacia.
 Cynocrambe.
 Corispermum.
 Acnida.
 Petiveria.
 Pisonia.
 angiospermous.
 capsular.
 closed.
 Axyris.
 Polycnemum.
 Queria.
 cut round.
 Amaranthus.
 Drypis.
 Trianthema.
 Cuscuta.
 valved.

Buffonia.
 Claytonia.
 Montia.
 Lechea.
 Convoloulus.
 Pectinea.
 berried.
 Bosea.
 Rivina.
 Phytolacca.
 Ipomœa.
 TWO OR MANY-FRUITED.
 Exalbuminous.
 rectembryous.
 VERTICILLATÆ.
 Blairia.
 Lippia.
 Hebbenstretia.
 * * *
 Schmidelia.
 Ochna.
 * * *
 Geum.
 Dryas.
 * * *
 Bannisteria.
 Scytalia.
 curvembryous.
 Steripha.
 Sapindus.
 Urena.
 Geranium.
 Albuminous.
 rectembryous.
 Selago.
 Dalea.
 * * *
 Myosurus.
 Ranunculus.
 * * *
 Retinaria.
 Tetracera.
 Entoganum.
 Illicium.
 Xylophia.
 Magnolia.
 Michelia.

curvembryous.

Limeum.

Nolana.

* * *

Dombeja.

Napæa.

Althea.

Malva.

Lavatera.

RADICLE SUPERIOR.

ONE-FRUITED.

Exalbuminous.

rectembryous.

gymnospermous.

Ancistrum.

Platanus.

Comptonia?

Stellera.

Anacardium.

angiospermous.

capsular.

Betula.

Alnus.

Ulmus.

Ægiceras.

Omphalobium.

Trichilia.

Moringa.

drupaceous.

Thymelæa.

Myrica.

Chionanthus.

Pygeum.

Nitraria.

Baryosma.

Prunus.

Amygdalus.

Pedalium.

Tetragastris.

berried.

Laurus.

Murraya.

Ardisia.

curvembryous.

Cannabis.

Lupulus.

Hiptage.

Caryolobis.

Rhus.

Celtis.

Sebestena.

Dammara.

* * *

Biscutella.

Iberis.

Alyssum.

Lepidium.

Anastatica.

Myagrum.

Crambe.

Coronopus.

Isatis.

Bunias.

Albuminous.

rectembryous.

gymnospermous.

Thuja.

Juniperus.

Casuarina?

Urtica.

Parietaria.

Rheum.

Globularia.

Cassya.

Pimelæa.

Dais.

angiospermous.

capsular.

Plumbago.

Pedicularis.

Melampyrum.

Fraxinus.

Polygala.

Fagara.

Syringa.

Ptelea.

Triumfetta.

Guajacum.

Cedrela.

Heliocarpus.

Oxalis.

Fagonia.

Linum.

drupaceous

Olea.
 Nageja.
 Antidesma.
 Camirium?
 Antelæa.
 Spathelia.
 Styrax.
 Melia.
 Hugonia.
 Messerschmidia,
 berried.
 Piper.
 Nandina.
 Ophioxylon.
 Aquifolium.
 Cyminosma.
 Royena.
 Ligustrum.
 Phillyrea.
 Cassine.
 Limonia.
 Mangostana,
 curvembryous.
 gymnospermous,
 Obione.
 Phryma.
 * * *
 Rumex.
 Polygonum.
 Eragrostis.
 Atraphaxis.
 Persicaria.
 Koenigea.
 Brunnichia.
 Coccoloba.
 angiospermous.
 Paronychia.
 Achyranthes.
 Gomphrena.
 Corrigiola.
 Morus.
 Rauwolfia.
 TWO OR MANY-FRUITED.
 Exalbuminous.
 rectembryous.
 gymnospermous,

Aphanes.
 Alchemilla.
 Agrimonia.
 Sibbaldia.
 Pentaphyllum.
 Comarum.
 Fragaria.
 Rosa.
 * * *
 Cerinthe.
 Buglossum.
 Borago.
 Cynoglossum.
 Symphytum.
 Onosma.
 Echium.
 Lithospermum.
 Lycopsis.
 Myosotis.
 Heliotropium.
 angiospermous.
 Nephelium.
 Cerbera.
 Tropæolum.
 Quassia.
 Spiræa.
 Rubus.
 Sitodium.
 curvembryous.
 Acer.
 Trioptefis.
 Rhizobolus.
 Ajenia.
 Meesia.
 Nelumbo.
 Albuminous.
 rectembryous
 gymnospermous.
 Callitriche.
 Myriophyllum.
 * * *
 Anemone.
 Adonis.
 Atragone.
 Clematis.
 Thalictrum.

angiospermous.

Mercurialis.

Tithymalus.

Acalypha.

Ricinus.

Clusia.

Croton.

Jatropha.

Emblia.

Excoecaria.

Ægopricon.

Buxus.

Bradleya.

* * *

Bartramia.

Forskohlea.

Diosma.

Zanthoxylon.

curvembryous.

Andrachne.

Phyllanthus.

Xylophylla.

Chamaelea.

* * *

Menispermum.

Coldenia.

RADICLE CENTRIPETAL.

ONE-FRUITED.

Exalbuminous.

rectembryous.

one-celled.

Pinguicula.

Cuphea.

two-celled.

Acanthus.

Barleria.

Ruellia.

Dianthera.

three-celled.

Hypericum.

Thea.

four-celled.

Elatine.

Ammannia.

Sesamum.

Alcanna.

five or more-celled.

Balsamina.

Citrus.

Cacao.

curvembryous.

Justicia.

Dodonæa.

Hippocastanum.

Rhexia.

Albuminous.

rectembryous.

one-celled.

Ortega.

Velezia.

* * *

Trientalis.

Euparea.

Centunculus.

Anagallis.

Limosella.

Lysimachia.

Cortusa.

Androsace.

Dedecatheon.

Primula.

two-celled.

Septum simple.

Receptacle

obsolete or sessile.

Veronica.

Euphrasia.

Sibthorpia.

Rhinanthus.

Stemodia.

Erinus.

Buchnera.

Browallia.

Scoparia.

Gratiola.

Melasma.

* * *

Peplis.

Exacum.

Celsia.

Hydrolea.

Codon.

Saxifraga.	Fraxinella.
Lythrum.	curvembryous.
<i>distinct.</i>	capsular.
Antirrhinum.	one-celled.
Mimulus.	<i>cut round.</i>
Dodartia.	Celosia.
Cymbaria.	Portulaca.
Calceolaria.	<i>three-valved.</i>
<i>free.</i>	Talinum.
Polypremum.	Telephium.
Ophiorrhiza.	Loefflingia.
<i>honey-combed.</i>	Alsine.
Glaucium.	Polycarpon.
Septum bilamellated.	<i>four-valved.</i>
Digitalis.	Sagina.
Scrophularia.	Mœhringia.
Capraria.	Dianthus.
Chelone.	<i>five-valved.</i>
Manulea.	Agrostemma.
Schwalbea.	Lychnis.
* * *	Spergula.
Buddleja.	<i>more-valved.</i>
Houstonia.	Stellaria.
Verbascum.	Arenaria.
Nama.	Holosteum.
three-celled.	Cerastium.
Olox.	two-celled.
Enargea.	Nicotiana.
Celastrus.	Hyoscyamus.
Polemonium.	three-celled.
Peganum.	Pharnaceum.
Azalea.	Mollugo.
Clethra.	Saponaria.
four or five-celled.	Silene.
Erica.	Cucubalus.
Pyrola.	* * *
Andromeda.	Pittosporum.
Kalmia.	four or more-celled.
Rhododendrum.	Stramonium.
Gaultheria.	Ruta.
Epacris.	Glinus.
Arbutus.	Cistus.
* * *	Aizoon.
Penthorum.	Hermannia.
Ledum.	Corchorus.
Antichorus.	Zygophyllum.

* * *

Abroma.

Ceiba.

Velaga.

Gossypium.

Pentapetes.

Sida.

Hibiscus.

Kleinhovia?

berried.

Cestrum.

Lycium.

Capsicum.

Atropa.

Solanum.

Physalis.

Nicandra.

Mandragora.

* * *

Canella.

Malvaviscus.

Two or MANY-FRUITED.

Exalbuminous.

rectembryous.

Staphylea.

Tribulus.

curvembryous.

Nerium.

Cardiospermum.

Helicteres.

Albuminous.

rectembryous.

Blackwellia.

Asclepias.

Cynanchum.

Vinca.

* * *

Tillæa.

Sedum.

Sempervivum.

* * *

Pæonia.

Delphinium.

Aconitum.

Helleborus.

Garidella.

Nigella.

Cimicifuga.

Aquilegia.

Isopyrum.

Caltha.

Trollius.

* * *

Annona.

curvembryous.

Abutilon.

RADICLE CENTRIFUGAL.

ONE-FRUITED.

Exalbuminous.

rectembryous.

Populus.

Tamarix.

Ascyrum.

Androsæmum.

Parnassia.

Martynia.

* * *

Cynometra.

Pterocarpus.

Arachis.

Hymenæa.

Guilandina.

Tamarindus.

curvembryous.

Most SILIQUOSE.

Most LEGUMINOSE.

Albuminous.

rectembryous.

Receptacle

obsolete or indefinite.

Drosera.

Gentiana.

Viola.

Papaya.

definite.

one-sided.

Fumaria.

Actæa.

* * *

Cæsalpinia.

Acacia.

Adenanthera.

Gleditschia.
 Cassia.
 Senna.
 Poinciana.
 Ceratonia.
 Cercis.
 two-sided.
 Chironia.
 Swertia.
 Menyanthes.
 Allamanda.
 Lathraea.
 Cysticapnos.
 Capnoides.
 Chelidonium.
 three-sided.
 Sarothra.
 Granadilla.
 Hydnocarpus.
 many-sided.
 Argemone.
 Papaver.
 curvembryous.
 Beta.
 Chenopodium.
 Salsola.
 * * *
 Reseda.
 Turnera.
 Helianthemum.
 Bixa.

Hypecoum.
 Some LEGUMINOSÆ.
 Cleome.
 Two or MANY-FRUITED.
 Liquidambar.
 Samadera?
 Balanopteris.
 Uvaria.
 RADICLE VAGUE.
 rectembryous.
 Hydrophyllum.
 Vareca.
 Kiggelaria.
 Melicytus.
 Besleria.
 Muntingia.
 Apeiba.
 curvembryous.
 Myrsine.
 Anguillaria.
 Aubletia.
 Morisona.
 Adansonia.

POLYCOTYLEDONES.

Pinus.
 Cupressus?
 Rhizophora.
 Canarium.
 Hernandia?
 Lepidium.

A DICTIONARY

of

BOTANICAL TERMS,

WITH THE ENGLISH BEFORE THE LATIN.

N. B. Those Terms, to which numbers only are added, will be found explained, by referring to the corresponding numbers of the Linnean Terms: Those, to which numbers are added with the letter p. prefixed, will be found explained, at the Pages indicated by their respective numbers.

ABB.

Abbreviated, *abbreviatus*. 563.
 Abortive, *abortivus* s. *abortiens*, falling off before maturity. It is also used in the same sense as *barren*.
 Abruptly, *abrupte*. See Pinnate.
 Acalyptrate, *acalyptratus*, without a calyptré.
 Accumbent, *accumbens*. p. 167.
 Acerose, *acerosus*. 170.
 Acicular, *acicularis*, resembling a small needle.
 Acid, *acidus*. 1321.
 Acinaciform, *acinaciformis*. 270.
 Acotyledonous, *acotyledonis* s. *acotyledoneus*. 1215.
 Acotyledonous seeds produce no seminal leaves when they vegetate. p. 162.
 Acrid, *acris*. 1326.

ACU.

Acuminate, *acuminatus*. 210. p. 73.
 Acute, *acutus*. 209.
 Adductors, *adductores*. p. 69.
 Adnate, *adnatus*. 151. 304. p. 127.
 Adverse, *adversus*. 142.
 Aggregatæ, the name of the 48th Natural Order. See Vol. II. p. 343.
 Aggregate, *aggregatus*. 459. 1122. p. 100.
 Albumen. p. 151.
 Albuminous, *albuminosus*, having an albumen.
 Alburnum, the soft whitish substance, which in trees is placed between the inner bark and the wood. By workmen it is named *Sap*.

Algæ, the name of the 3d Order in the Class Cryptogamia. p. 63. It is also the name of the 57th Natural Order. See Vol. II. p. 351.

Almond-fleshy, *amygdalino-carnosum*. p. 135.

Alpine, *alpinus*. 1237.

Alternate, *alternus*. 95. 115.

Alternately, *alternatim*. See Pinnate.

Alveolate, *alveolatus* s. *favosus*. 1120. p. 124.

Ambrosial, *ambrosiacus*. 1308.

Ament, *amentum*. 462.

Amentaceæ (from *amentum*), the name of the 50th Natural Order. See Vol. II. p. 339.

Amentaceous, *amentaceus*, growing in an ament.

Anastomosing, *anastomosans*. p. 88.

Androgynous, *androgynus*. 1200. p. 66.

Angiospermia (from *αγγος* vessel, and *σπέρμα* seed), the name of the 2d Order in the Class Didynamia. p. 60.

Angiospermous, *angiospermus*, having the seeds in a capsule.

Angiothecium, (from *αγγος* vessel, and *θήκη* case) the name of Persoon's first class. See Vol. II. p. 288.

Angled, or Angular, *angulatus*. 53. p. 135.

Annual, *annuus*. 1.

Annulate, *annulatus*. See Ringed.

Anomalous, *anomalus*. p. 112.

Anther, *anthera*. 750. p. 69.

Antheriform, *antheriformis*, anther-like.

Anthesis, the period at which the pollen is applied to the stigma.

Apetalous, *apetalus*, destitute of petals.

Apex, top, or summit.

Apiculate, *apiculatus*. p. 125. 138.

Apophysis, a process, or protuberance, upon which the capsule of some Musci is placed. p. 70.

Appendage, *appendicula*, an additional part, generally leaf-like.

Appendaged, or Appendiculate, *appendiculatus*, *auritus*, s. *auriculatus*. 307. p. 131.

Appressed, *appressus*. 132.

Approximate, *approximatus*. 624.

Arachnoid, *arachnoideus* s. *araneosus*, covered with a cobweb-like substance; or resembling a cobweb. p. 107.

Arboreous, *arboreus*. 26.

Arborescent, *arborescens*, from herbaceous becoming woody.

Arch, *fornix*, a small scale, or valve, observed in the throat of the corol of some flowers.

Arched, *fornicatus*. 653; or turned like an arch, as the upper lip of Ringent flowers, e. g. *Lamium*, &c.

Arilled, *arillatus*. 1051.

Aril, *arillus*. 1100. p. 150.

Arms, *arma*. 377.*

Aromatic, *aromaticus*. 1314.

Artificial, *artificialis*. 1363.

Ascending, *ascendens*. 35. 1005.

Asexual, *asexualis*, destitute of sex, and flowers, bearing buds only.

Ash-coloured, *cinereus*. p. 87.

Asperifoliæ (from *asper* rough, and *folium* a leaf,) the name of the 41st Natural Order of Linnæus, See Vol. II. p. 336.

Assurgent, *assurgens*. 135. 746.
 Attenuated, *attenuatus*. 442.
 Auriculate, *auriculatus*. See
 Appendaged.
 Autumnation, *autumnatio*. 1265.
 Awn, *arista*. 606. p. 145.
 Awned, *aristatus*. 603. p. 141.
 Awnless, *muticus*. 604. 969. 1186.
 Axil, *axilla*, the angle which a
 branch forms with a stem; or
 a leaf with a branch.
 Axillary, *axillaris* s. *subalaris*.
 113.
 Axipendulous, *axipendulus*. p.
 133.

BAC.

Baccation, *baccatio*. 1209.
 Bacciferous. See Berry-bearing.
 Back, *dorsum*. p. 105. 132.
 Barb, *glochis*. 368. p. 145.
 Bark, *cortex*. Strictly speaking,
 the bark consists of 3 coats:
 1. The cuticle, *epidermis*. 2.
 The outer bark, *cortex*. 3.
 The inner bark, *liber*.
 Bark-like. See Cortical.
 Barren, *sterilis*. 819.
 Base, *basis*. p. 132.
 Basilar, *basilaris*. p. 64.
 Bay, *badius* s. *spadiceus*. p. 87.
 Beak, *rostrum*, a process shaped
 like the beak of a bird. p. 73.
 143.
 Beaked, *rostratus*. 769. p. 73.
 Beard, *barba*. 358.
 Bearded, *barbatus*. 240.
 Beardless, *imberbis*, destitute of
 a beard. 679.
 Bell-shaped. See Campanulate.
 Belly, *venter* s. *ventriculus*. p.
 105. 132.
 Bellying. See Ventricose.
 Bent, *flexus*. 909.
 Berried, *baccatus*. 1084. p. 112,
 115. 120. 136.

Berry, *bacca*. 1029. p. 117. 118.
 Berry-bearing, *baccifer*.
 Bicapsular. See Two-capsuled.
 Bicornes (from *bis* twice, and
cornu a horn), the name of the
 18th Natural Order. See Vol.
 II. p. 321.
 Bidentate. See Two-toothed,
 &c.
 Biennial, *biennis*. 2.
 Bifarious, *bifarius*. 117.
 Bifariously, *bifariam*.
 Bifid, or Two-cleft, *bifidus*. 183.
 Biflorous. See Two-flowered.
 Bigeminate, *bigeminus*. 284.
 Bijugous, *bijugus*. 283.
 Bilabiate. See Two-lipped.
 Bilamellated, *bitamellatus*. 803.
 In the form of a flattened sphere,
 and longitudinally two-cleft.
 Bilateral, *bilateralis*. p. 128.
 Bilobate. See Two-lobed.
 Bilocular. See Two-celled.
 Binary, *binarius*. p. 115.
 Binate, *binatus*. 280.
 Bipartible. See Two-partible.
 Bipartite. See Two-parted.
 Bipinnate, *bipinnatus*. 286.
 Bipinnatifid, *bipinnatifidus*, al-
 most bipinnate, the segments
 not extending to the mid-rib
 of the leaf.
 Bitermate, *bitermatus*. 285.
 Bitter, *amarus*. 1322.
 Bivalve. See Two-valved.
 Black, *niger* s. *ater*, &c. 1331.
 p. 87. 138.
 Blackish, *nigricans* s. *subniger*,
 p. 87.
 Bladder, *utriculus*. 369.
 Blood-coloured, *sanguineus*. p.
 87.
 Blue, *cæruleus*. 1334. p. 139.
 Boat-shaped, *cymbiformis* s. *na-
 vicularis*. p. 144.
 Bony, *osseus*. 1086. p. 115. 148.

Border. See *Lamina*, and *Limbus*.

Bossed, *umbonatus*, having a boss, *umbo*, in the centre as the pileus of an Agaric. p. 86.

Bowed, *arcuatus*. 740. p. 168.

Brachiate, *brachiatus*. 86.

Bracte, *bractea*. 393.*

Bracteate, *bracteatus*. 448. p. 134.

Bracteless, or **Ebracteate,** *ebracteatus*, without a bracte.

Branch, *ramus*, p. 5.

Branched, or **Branching,** *ramosus*. 5. 88. 364.

Branch-leaf, *rameum folium*. 112.

Branchlet, *ramulus*, the subdivision of a branch.

Branch-peduncle, *rameus pedunculus*, a peduncle arising from a branch.

Branny, *fufuraceus*. p. 84.

Breathing, *spirans*. 1312.

Bristle, *seta*. 361.

Bristlet, or **Small bristle,** *setula*.

Bristle-bearing, *setifer*.

Bristle-shaped. See **Setaceous**.

Bristly, *setosus*. p. 125.

Brittle, *fragilis*.

Broad-leaved, *latifolius*. 1184.

Brown, *fuscus* s. *brunneus*. p. 87. 139.

Brownish, *subfuscus*. p. 87.

Bud, *gemma*. 1151. See the distinction of *bud* and *bulb*, given in Vol. II. p. 315.

A **Bud** (*gemma* or *germen*) according to Gærtner is, generally speaking, an organic body, sprouting from the surface of plants, and, in the beginning, different from their proper and permanent parts, but, after some time, either becoming a part of the plant, or, if separated,

growing into a new plant, perfectly similar to the parent, (without previous fecundation), by the sole and simple increase of its proper substance. The species of buds are four, two leafless, and two leafy, or scaly, viz.

1. *Propago*: This is a perfectly simple, leafless bud, of different forms, sometimes entirely naked, sometimes shut up in a bark-like case; which at length separates spontaneously from its parent, and is scattered like a seed. The granular buds of Oeder (*Elem. botan.* p. 35) belong to this species.

2. *Gongylus*: This is a perfectly simple, leafless, somewhat globular, solid bud, remaining within the bark of the parent, and not separating spontaneously, till this be consumed by age. It is nearly allied to the tubers of roots; but, since a *tuber* is generally a proper member of the plant, has a manifold principle of life (so that it may be disseminated in pieces), and only produces a new plant from a preceding foliaceous bud, the *gongylus*, in which these qualities are not found, is considered as sufficiently distinct from the *tuber*.

3. *Bulbus*: This is a compound, somewhat globular, nearly leafless bud, formed of a very short keel, and thick succulent scales, which at length separates spontaneously from its parent. Bulbs are of two kinds, 1. *solid*, constructed of a solid fleshy body, and having generally the rudiments of the new plant, fixed outwardly upon it: 2. *coat-*

ed, formed of several concentric scales, cherishing the rudiment of the young plant in their centre.

4. *Gemma* (bud strictly so named): This is a bud composed of a subulate keel, and evident herbaceous leaflets; it resembles a branch in miniature, and never separates spontaneously from its parent. It is named an *Eye* (*oculus*), when it puts forth flowers alone, or flowers and leaves; and simply a *Gem* (*gemma*), when it is unfolded into mere leaves.

The *Parts* of Buds are, first, essential and perpetual, as the *flesh* (*caro*) or, as it is more commonly called, *marrow* or *pith* (*medulla*), and the *bark* (*cortex*): secondly, merely accessory, and temporary, as the *involucres* (*involucra*), *cases* (*thecæ*), and other coverings.

The distinction of a bud from a seed, although generally easy, is sometimes very difficult, it will therefore be necessary to give a precise definition of both. A *Bud* is an organ of propagation, of which the proper integument grows under germination, and, together with the *medulla*, is wholly converted into the young plant. A *Seed* is an organ of propagation, which, under germination, throws off its proper integument, its internal parts alone, or some of them only, growing into the new plant. See Gærtner, *Introductio*. Budding. See Gemination.

Buff, *stramineus* s. *subflavus*. p. 87.

Bulb, *bulbus*. 1146. See Bud.

Bulb-bearing, or Bulbiferous, *bulbifer* s. *bulbiger*. 79. 1195.

Bulbous, *bulbosus*. 15.

Bullate, *bullatus*. 229. p. 135.

Bursting elastically, *dissiliens elastice*.

CAD.

Caducous, *caducus*. 273. 550. 579. 685. p. 140.

Calcarate. See Spurred.

Calamariæ (from *calamus* a reed), the 3d Natural Order. See Vol. II. p. 309.

Calendar, *calendarium*. 1269.

Calycanthemæ (from *καλυξ* calyx, and *ανθος* a flower, the name of the 17th Natural Order. See Vol. II. p. 320.

Calycifloræ (from *calyx* calyx, and *flos* a flower) the name of the 16th of the Natural Orders. See Vol. II. p. 320.

Calycine, *calycinus*. 375. 387. 697. See Calyx—Scales, &c.

Calycle, *calyculus*. 1099.

Calyclad, *calyculatus*. 587. p. 140.

Calyptra, *calyptra*. 620. p. 68.

The Calyptra, by Linnæus, and other authors, is considered as the *calyx* of Mosses. Hedwig at first regarded it as the corol, but from more accurate attention to this part, he is convinced, that it does not belong to the coverings, envelopping the female organ, but is part of the female organ itself. The first office, which the *calyptra* performs, consists in strengthening the attachment of the style to the rudiment of the fruit. See *Hedw. theoria*, p. 144.

Calyptræd, or Calyptrate, *calyptratus*, furnished with a calyptra.

Calyx, *calyx*. 543. See Perigonium.
 Calyx-scales, *squamæ calycinae*, scales of the calyx.
 Calyx-leaflets, *foliola calycina*, leaflets of the calyx.
 Calyx-thorns, *spinæ calycinae*. 387.
 Campanaceæ (from *campana*, a bell), the name of the 29th Natural Order. See Vol. II. p. 326.
 Campanulate, *campanulatus*. 642.
 Cancellate, *cancellatus*, latticed. p. 137.
 Canaliculate. See Channelled.
 Capillaceous, *capillaceus*, or Capillary, *capillaris*, 708. 1095. p. 141.
 Capitate, *capitatus*. 881.
 Capituliform, *capituliformis*. p. 67.
 Capsule, *capsula*. 919. p. 70. 111.
 Capsular, or Capsuled, *capsularis*, having a capsule.
 Carinated. See Keeled.
 Cartilaginous, *cartilagineus*. 199. p. 154.
 Caryophyllei (from *caryophyllus* a pink), the name of the 22d. Natural Order. See Vol. II. p. 322.
 Case, *theca*. p. 71.
 Castrated, *castratus*. 718.
 Caulescent, *caulescens*, having a stem, different from that, which supports the flower; or becoming like a stem; as the root of a cabbage, &c.
 Cauline, *caulinus*. See Stem-leaf, &c.
 Cell, *loculamentum*. 950. p. 106.
 Celled, *locularis*, having cells,

Central, *centralis*. p. 84. 109. 128. 174.
 Centrifugal, *centrifugus*. p. 133.
 Centripetal, *centripetus*. p. 133.
 Cernuous, *cernuus*. 424. p. 71.
 Cespitose, *cæspitosus*. 1245.—
 A cespitose, or turfy, plant has many stems from the same root, which are closely matted together.
 Chaff, *palea*, a dry membranous body, separating the florets in some genera of the class Syngenesia. p. 125.
 Chaffy, or Chaff-like, *paleaceus*, furnished with chaffs, or like chaffs. 1082. 1114. p. 125. 141.
 Chalaza. p. 149.
 Chalk, *creta*. 1256.
 Channelled, *canaliculatus*. 247.
 Character. See Natural, Essential, Factitious, Habitual.
 Cheese-like, *caseosus*. p. 154.
 Chesnut-colour, *castaneus*. p. 87. 138.
 Chinky, *rimosus*. 63. p. 155. 168.
 Cicatrized, *cicatrizatus*, scarred.
 Cilia, parallel hairs, like eyelashes.
 Ciliate, *ciliatus*. 196. p. 74. 142.
 Circinal, *circinalis*. 1167.
 Circular, See Orbicular.
 Cirrhiferous. See Tendril-bearing.
 Cirrhose. See Tendrilled.
 Class, *classis*. A primary division in a system.
 Claw, *unguis*. 631.
 Clawed, *unguiculatus*, furnished with a claw. p. 89.
 Clay, *argilla*. 1255.
 Cleft, *fissus*. 183. See Two-cleft, &c.
 Climate, *clima*. 1229.

Climbing, *scandens*. 47.
 Close, *coarctatus*. 535.
 Closed, *clausus*. 652.
 Club-shaped, *clavatus* s. *clavæformis*. 292. p. 67.
 Coadunatæ, the 52d of Linnaeus's Natural Orders. See Vol. II. p. 348.
 Coadunate, *coadunatus*. 152.
 Coalesced, *coalitus*, united into one body.
 Coated, *tunicatus*. 64. 1148. p. 94.
 Cobweb-like, *araneosus*, s. *arachnoideus*.
 Coccum, a cell of some fruits, containing one seed. p. 114.
 Cochleate, See Spiral.
 Cohering, *cohærens*. 793.
 Collar, *collare*. p. 84.
 Collared, *collari instructus*. p. 84.
 Collateral, *collateralis*. p. 167.
 Colour, *color*. 1329.
 Coloured, *coloratus*. 218.
 Column, *columella* s. *columnula*. 954. p. 73.
 Columnar, *teres*, s. *columnaris*. 49. 257. 294. 926.
 Columniferæ (from *columna* a pillar, and *fero* to bear), the name of the 37th Natural Order. See Vol. II. p. 332.
 Coma, or Tuft, *coma*, a species of bracte, terminating the stem. p. 143.
 Comb-like, See Pectinate.
 Comose, *comosus*. 519.
 Common, *communis*. 400. 582. 1110. 1157. p. 126.
 Compact, *compactus*. 102. 261. See Close.
 Complete, *completus*. A flower is said to be complete, when it has both calyx and corol.

See page 104. 109. 150. 171.
 Compositæ, the name of the 49th Natural Order. See Vol. II. p. 343.
 Compound, *compositus*. 455. 460. 505. 521. 542. 689. 1121. p. 75. 99. 107. 122. 142. 175.
 Compressed, *compressus*. 51. 259. p. 166.
 Concave, *concavus*. 248. p. 130.
 Concealed, *latitans*.
 Conceptacle, *conceptaculum*, a follicle or pericarp of one valve, opening on one side in a longitudinal direction, and having the seeds loose in it.
 Conduplicate, *conduplicatus*. 1159.
 Conduplicating, *conduplicans*. 1293.
 Cone, *conus*. See Strobile.
 Confluent, *confluens*. 123. p. 90.
 Conform, *conformis*. 1175.
 Congelation, *congelatio*. 1278.
 Conglobate, *conglobatus*. p. 169.
 Conglomerate, *conglomeratus*, heaped together.
 Conical, *conicus*. 830. 1118. p. 176.
 Coniferæ. (from *conus* a cone, and *fero* to bear), the name of the 51st Natural Order. See Vol. II. p. 347.
 Conjugate, *conjugatus*. 278. p. 96. 175.
 Connate, *connatus*. 156. 728. 790.
 Consociated, *consociatus*. p. 100.
 Contiguous, *contiguus*. p. 166.
 Contortæ, (from *contorqueo*, to twist together), the name of the 30th of the Natural Orders. See Vol. II. p. 325.
 Contorted, *contortus*. A contorted corol has the edge of

- one petal lying over the next to it in an oblique direction, as in *Vinca*. A contorted *pericarp* signifies a twisted pericarp.
- Contracted, *contractus*. 537.
- Contrary, *contrarius*, a contrary or transverse dissepiment is placed at right angles with the valves. p. 110. 131. See Transverse.
- Converging, *connivens*, 741. A converging corol has the tops of the petals meeting so as to close the flower. When applied to the sleep of plants, it denotes, that the two opposite leaves have their upper surfaces so closely applied, as to appear only one leaf. 1289. p. 169.
- Convex, *convexus*. 249. 1131.
- Convolute, *convolutus*. 354. 1160. p. 169.
- Copulative, *copulativus*. p. 109.
- Corcle, *corculum*. 1088. It is the essence of the seed, being the rudiment of the future plant. It consists of the *plumule*, or scaly ascending part; and the *rostel*, or *radicle*, which is the simple descending part.
- Cordate, *cordatus*. 176.
- Cork-like, *suberosus*. 62. p. 126.
- Coriaceous, *coriaceus*. 945. p. 136. 147. 154.
- Cornered, *angulatus* s. *angularis*, or *gonus* in composition.
- Corniculate, or Cornuted. See Horn-shaped.
- Corol, *corolla*. 626. See Perigonium.
- Corolline, *corollinus*. 721.
- Corolliferous, or Corol-bearing, *corollifer*.

- Coronariæ (from *corona* a garland), the name of the 10th Natural Order. See Vol. II. p. 316.
- Coronet, or Coronule, *coronula*, a small crown.
- Coronnetted, or Coronulate, *coronulatus*, supporting a coronet.
- Cortical, *corticalis*. 1154.
- Corticated, *corticatus*. p. 112. 113. 119. 120.
- Corydales (from *κorymbos* a helmet), the name of the 24th Natural Order. See Vol. II. p. 324.
- Corymb, *corymbus*. 464.
- Corymbous, *corymbosus*, having a corymb.
- Cottony, *gossypinus*. p. 160.
- Cotyledon, *cotyledon*. 1091. It is used to denote not only the seed-lobe, but also the seed-leaf. See page 160.
- Covered, *tectus*. 812. p. 94.
- Cowled, *cucullatus*. 250.
- Cracking. See Chinky.
- Creeping, *repens* s. *reptans*. 8. 43.
- Crenate, *crenatus*. 194.
- Crenulate, *crenulatus*, having the margin cut into very small notches.
- Crested, *cristatus*, having an appendage, like a crest, as the corol of *Polygala*. 1193. p. 117.
- Crest, *crista*. p. 144.
- Crescent-shaped, *lunatus* s. *lunulatus*. 178.
- Crinite, *crinitus*, hairy, or having long hair. p. 117.
- Crisped. See Curled.
- Crossed, Cross-form, or Cruciform, *cruciformis*. 659. 894.
- Cross-wise, *cruciatim*.
- Crowded, *confertus*. 98. 119. 497. 534.
- Crown, *corona*. 1092.

Crowned, *coronatus*. 942.
 Crown-shaped, *coroniformis*. 893.
 Cruciform. See Crossed.
 Crustaceous, *crustaceus*. p. 136. 148.
 Cryptogamia (from *κρυπτος* hidden, and *γάμος* nuptials), the name of the 24th Class in the Artificial System of Linnæus. See page 59.
 Cryptogamous, *cryptogamus*, having the fructification concealed, or scarcely, if at all, observable by the naked eye.
 Cubit, *cubitus*. 1357.
 Cucurbitaceæ (from *cucurbita* a gourd), the name of the 34th Natural Order. See Vol. II. p. 330.
 Culinary, *culinaris*. 1364.
 Culm, *culmus*. 20.
 Cultivated, *cultus*. 1251.
 Cuneiform, *cuneiformis*. 164.
 Cup-bearing, *scyphifer*, having small cups, as some of the Lichens.
 Cupform, *scyphiformis*.
 Curled, *crispatus* s. *crispus*. 253. p. 117.
 Curtain, *velum* s. *volva*. 628. and p. 85. As *Volva* is used for the Wrapper, it would be better to use *Velum* only for curtain.
 Curvembryous, *curvembryus*, having a crooked embryo.
 Curvature, *curvatio*. 1208.
 Curved, *curvus*. p. 135. 173.
 Cushion-like, *pulvinatus*. p. 86.
 Cuspidate, *cuspidatus*. 211.
 Cut round, *circumscissus*, opening or bursting all round. 943.

Cuticle, *epidermis*. p. 149. p. 161. See Bark.
 Cyathiform. See Glass-shaped.
 Cyclical, *cyclicus*. p. 173.
 Cylindrical, *cylindricus*, *cylindraceus* s. *teres*. 49. 510.
 Cymbiform. See Boat-shaped.
 Cyme, *cyma*. 452. 1137.

DAG.

Dagger-pointed. See Mucronate.
 Decagynia (from *δεκα* ten, and *γυν* woman), the name of an Order in the Sexual System. p. 60.
 Decagynous, *decagynus*, having ten pistils.
 Decandria (from *δεκα* ten, and *ανδ* husband), the name of the 10th Class in the Linnean System. See page 58.
 Decandria is also the name of an Order. See page 61.
 Decandrous, *decandrus*, ten-stamened, or having ten stamens.
 Decapetalous. See Ten-petalled.
 Decaphyllous. See Ten-leaved.
 Deciduous, *deciduus*. 272. 549. 580. 686. 875.
 Declined, *declinatus*. 36.
 Declining, *declinans*.
 Decom-pound, *decompositus*, doubly compound. p. 15.
 Decumbent, *decumbens*.
 A decumbent stem is one, which lies on the ground with the base higher than the other parts. A decumbent flower has the stamens, and pistils bent down to the lower side of it.
 Decurrent, *decurrentis*. 153. 305. p. 88.

Decursively, *decursive*. See Pinnate.

Decussated, *decussatus*. 127.

In a decussated manner, *decussatim*.

Dedaleous, *dedaleus*. 203.

Deflected, *deflexus*. 105.

Deflorate, *defloratus*. 820.

Defoliation, *defolatio*. 1277.

Deltoid, *deltoides* s. *deltoides*. 173.

Demersed, *demersus*, the same as *Submersed*, which see.

Dense, *densus* s. *coarctatus*. 535.

Dentate. See Toothed.

Denticulate, *denticulatus*, furnished with very small teeth.

Dependent *dependens*. 140.

Depressed, *depressus*. 258.

Dermatocarpum (from *derma* skin, and *karpos* fruit), the name of one of Persoon's Orders. See Vol. II. p. 289.

Devious, *devius*. p. 131.

Dew, *ros*. p. 146.

Diadelphia (from *dis* twice, and *adelphos* brother), the name of the 17th Class in the Linnean System. See p. 58.

Diadelphous, *diadelphus*, having the stamens united by their filaments into two sets.

Diandria (from *dis* twice, and *aner* husband), the name of the 2d Class. See p. 58.

Diandria is also the name of an Order. See p. 62.

Diandrous, *diandrus*, having 2 stamens.

Diaphanous, *diaphanus*. 982.

Dichotomous, *dichotomus*. 85.

Dicoccous. See Two-grained.

Dicotyledonous, *dicotyledonis* s. *dicotyledoneus*. 1221. p. 164.

Didymous, *didymus*. 818. 838.

Didynamia (from *dis* twice, and *dynamis* power), the name of the 14th Class in the Sexual System. See page 58.

Didynamous, *didynamus* s. *didynamicus*, having four stamens, two of which are constantly shorter.

Difform, *difformis*. 640. 1176. p. 88. 135. 140.

Diffuse, *diffusus*. 39. 539.

Digitate, *digitatus*. 279. p. 117. 175.

Digynia, (from *dis* twice, and *gyn* woman), the name of an Order. See page 60.

Digynous, *digynus*, having two pistils.

Dimorphous, *dimorphus*. p. 67.

Dioecia (from *dis* twice, and *oikos* house), the name of the 22d Class of the Linnean System. See page 59.

Dioecia is also an Order of the Class Polygamia. See p. 62.

Dioicous, *dioicus*. Having male and female flowers on distinct individuals.

Dipetalous. See Two-petalled.

Diphyllous. See Two-leaved.

Dirty-yellow, *sordide flavus*. &c. &c.

Discoid, *discoideus*, a compound flower, which has a disk, like a radiate flower, but no ligulate florets. p. 134. See Disk-like.

Disk, *discus*. The disk of a leaf is its whole surface, *discus supinus* being the upper, and *discus pronus*, the under surface.—The Disk of a flower is the central part in radiate compound flowers; and it is applied to aggregate flowers, when the florets in the centre

differ from those in the circumference, as in Umbels.
 Disk-like, *disciformis*. p. 67.
 Dissected. See Gashed.
 Dissepiment, *dissepimentum*.
 952. p. 109.
 Dissimilar, *dissimilis*. p. 142.
 Distant *distans*.
 Distichous. See Two-rowed.
 Distinct, *distinctus* s. *sejunctus*.
 789. p. 89.
 Divaricate, *divaricatus*. 104.
 Diverging, *divergens*. 103. 546.
 p. 167.
 Divided, *divisus*. p. 155.
 Dodecagynia (from *dōdeka* twelve, and *gynē* woman), the name of an Order in the 11th Class of the System of Linnæus. See page 60.
 Dodecagynous, *dodecagynus*, having twelve pistils.
 Dodecandria (from *dōdeka* twelve, and *andros* husband), the name of the 11th Class in the Sexual System. See page 58.
 Dodecandria is also the name of an Order. See page 61.
 Dodecandrous, *dōdecandrus*, 12-stamened.
 Dolabriform. See Hatchet-shaped.
 Dorsal, *dorsalis*. 608.
 Dorsiferous, *dorsifer*, bearing fructifications on the back of the leaf.
 Dorsipendulous, *dorsipendulus*.
 p. 138.
 Dotted, *punctatus*. 232. 1112.
 p. 138.
 Double, *duplex*. p. 75.
 Doubly, *duplicato*—in composition.
 Doubly-pinnate. See Bipinnate, &c.
 Down, *lanugo*.

Downy, *lanuginosus*.
 Dry, *siccus*. 1022. 1320.
 Drupe, *drupa*. 1020. p. 115.
 Drupaceous, *drupaceus*, having drupes; or drupe-like as the fruit of *Bunias Cakile*. p. 120. 122.
 Dumosæ (from *dumus* a bush), the name of the 43d Natural Order. See Vol. II. p. 338.
 Duration, *duratio*. 1299.

EAR.

Eared, *auritus*. See Appendaged.
 Ear-shaped, *auriformis*.
 Early, *præcox*. 1262. 1266.
 Earth, *terra*. page 50.
 Ebracteate. See Bracteless.
 Ecalcarate. See Spurless.
 Eccentric, *eccentricus*. p. 84.
 174.
 Echinate, *echinatus*, beset with prickles like a hedge-hog, as the the pericarp of *Datura Stramonium*. page 75.
 Economical, *æconomicus*. 1368.
 Economy, *æconomia*. 1360.
 Eglandulous, *eglandulosus*, without glands.
 Elastic, *elasticus*. 936.
 Elastically, *elastice*.
 Elasticity, *elasticitas*. 1212.
 Elliptical, *ellipticus*. 168.
 Emarginate, *emarginatus*. 205.
 Embracing, *amplexans* s. *amplectens*. Embracing the stem. 154. See Stem-clasping.
 Embryo. p. 171.
 Endecandria (from *endeka* eleven, and *andros* husband), the name of an Order in the Class Monadelphia. See p. 61.
 Enlarged, *ampliatus*.
 Enneandria (from *ennea* nine, and *andros* husband), the name of the ninth Class of the

Linnean System. See page 58.
 Enneandria is also the name of an Order. See page 61.
 Enneandrous, *enneandrus*, having nine stamens.
 Ensatae (from *ensis* a sword), the name of the 6th Natural Order. See Vol. II. p. 312.
 Ensiform, *ensiformis*. 268.
 Entire, *integer*. 171. p. 148.
 Ephemeral, *ephemerus*. 1303.
 Epidermis. p. 149. See Bark.
 Epigean, *epigeus*. p. 164.
 Epiphyllous, *epiphyllous*, bearing seeds on the leaf.
 Equal, *aqualis*. 571. 639.
 Equinoctial, *equinoctialis*. 1286.
 Equitant, *equitans*. 1164.
 Erect, *erectus*. 30. 101. 129. p. 127. 133.
 Eroded, *erosus*. 202.
 Essential, *essentialis*. An essential character serves to distinguish, by a single circumstance, one genus from all the others in the same natural order. It consists of the most proper particular mark of the genus, to which it is applied, as e. g. the *jointed filaments* in *Salvia*, the *bifid filaments* of *Crambe*, &c.
 Estivation, *aestivatio*. 1168.
 Even, *lævis*. 65.
 Evolute, *evolutus*, without a wrapper.
 Evergreen, *sempervirens*. 276.
 Exalbuminous, *exalbuminosus*, destitute of albumen.
 Excavated, *excavatus*, hollowed.
 Exfoliation, *exfoliatio*. 1276.
 Expanded, *expansus* s. *patens*. See Spreading.

Exstipulate. See Stipule-less.
 External *externus*. p. 130. 152.
 Extrafoliaceous, *extrafoliaceus*. 321.
 Eye, *hilum*. The eye of a seed, as the Bean, is the external scar, formed by the end of the umbilical chord, by which it is attached to the pericarp, 1087.

FAC.

Factitious, *factitius*.—A factitious character serves to distinguish one genus from all the others, in the same order of an artificial arrangement; but not in a natural order. It consists of a greater or less number of characteristic marks.
 Falcate. See Sickle-shaped.
 Fallow, *arvensis*. 1253.
 Families, *familia*. Vegetables, according to Linnæus (Phil. Bot. § 78.) comprehend seven families, *Fungi*, *Algæ*, *Musci*, *Filices*, *Gramina*, *Palma*, *Plantæ*. The *Plantæ* include all vegetables, that are not contained in the preceding families.
 Fanshaped, *flabellatus* s. *flabelliformis*. p. 86.
 Fasciate, *fasciatus*. 1183.
 Fascicle, *fasciculus*. 468.
 Fascicular, *fascicularis*. 13.
 Fascicled, or Fasciculate, *fasciculatus*. 121.
 Fastigate, *fastigiatus*. 92. p. 73.
 Fathom, *orgya*. 1358.
 Fatty, *pinguis*. 1323.
 Fawn-colour, *cervinus*. p. 87.
 Feathery, *plumosus*. 365. 1096. p. 142.

Female, *femina* s. *femininus*.
1198.

Fencing round, *circumsepiens*.
See Fortifying round.

Fertile, *fœcundus*. 821.

Few, *rarus*.

Few-flowered *pauciflorus*.

Few-rayed, *radiis paucis*.

Fibrous, *fibrosus*. 4. p. 115.

Figured, *figuratus*, s. *effiguratus*. page 74.

Filament, *filamentum*. 707.

Filamentous, *filamentosus*,

Filices, the name of the 1st Order of the Class Cryptogamia.

See page 62. And also the name of the 55th Natural Order. See Vol. II. p. 348.

Filiform, *filiformis*. 441.

Fimbriate, *fimbriatus*, fringed, the hairs not so regularly disposed as in the ciliate corol. *Menyanthes trifoliata* is an instance of a fimbriate corol.

Fistulous, *fistulosus*. 29.

Five-capsuled. See Capsular.

Five-celled. See Celled.

Five-cleft. See Cleft, &c. &c.

Fixed, *stipiti annexus*. p. 88.

Flaccid, *flaccidus*. 428.

Flat, *planus*. 246. 709.

Flattish, *planiusculus*.

Flesh-colour, *carneus* s. *incarnatus*. p. 87.

Fleshy, *carnosus*. 264. 946. 996. p. 148. 154.

Flexible, *flexilis*.

Flexuose, *flexuosus*. p. 169.

Floating, *natans*. 146.

Flocculent, *floccosus*. p. 86.

Floral *floralis*. 114. 1156.

Florescence, *florescentia*. 1272.

Floret, *flosculus*, the partial, or distinct small flower of a compound, or aggregate flower.

Floscular, or Flosculous, *floscu-*

losus. A floscular flower is the tubular floret of Syngenesious plants. *Semi-flosculous* has the same signification as *Ligulate*.

Flourishing, *florens*, flowering; flourishing; retaining its verdure.

Flower-bearing, or Floriferous, *florifer*. See page 65.

Flower, *flos*, the stamens and pistils of a vegetable with. or without their coverings. The essential parts, are the anther, and germen with the stigma.

Folded, *plicatus*. 1182. See Plaited.

Foliaceous, *foliaceus*. 371. 518. p. 166. 172.

Foliar, *foliaris*. 348. 1155.

Foliation, *foliatio*. See Vernation.

Follicle, *folliculus*. 1019. p. 69. 111.

Foot, *pes*. 1356.

Fork, *furca*. 382.

Forked, *furcatus*. 774.

Fortifying, *muniens*. 1292.

Fortifying round, *circumsepiens*, 1291. when, during sleep, leaves which are at other times placed horizontally, are erected into the form of a funnel. 1236.

Fovilla, *fovilla*. See Pollen.

Four-cleft. See Cleft.

Four-leaved, *teeraphyllus*. 552.

Four-winged, *quadrialatus*, s. *tetrapterus*. p. 144.

Fragrant, *fragrans*. 1310.

Free, *liber*, on every side detached. p. 127.

Friable, *friabilis*. p. 154.

Fringed. See Fimbriate.

Fronde, *frons*, a perfect frond consists of a stipe passing into a leaf or leaves; but the term is also applied to *Lichens*,

which have no stipe, but only a leafy or coriaceous part supporting the fructifications.

Frondescence, *frondescentia*. 1260. 1271.

Frondose, *frondosus*. 1192.

Frondosi, *frondosi*. See p. 64.

Frutescence, *frutescentia*, the fruiting season, when plants scatter their ripe seeds.

Fructification, *fructificatio*, p. 24.

Fruit, *fructus*, the seed with or without a pericarp. p. 92.

Frutescent, *frutescent*, a stem is named frutescent, when from herbaceous it becomes shrubby.

Fugacious, *fugax* s. *evanescent*, of short continuance. p. 85.

Fulcrate, or Fulcred, *fulcratus*. 108.

Fulcre, *fulcrum*. p. 15.

Full, *plenus*. 1190.

Fungi, the name of the 4th Order of the Class Cryptogamia.

See page 63. And also the name of the last Natural Order. See Vol. II. p. 352.

Fungiform, *fungiformis*. p. 172.

Furigous, *fungosus*. 1079. p. 135.

Funnel-shaped, *infundibuliformis*. 643.

Furrowed, *sulcatus* s. *exaratus*. 67. 226. p. 117. 137. 155.

Fusiform, *fusiformis*. 6.

GAP.

Gape, *rictus*, the opening betwixt the lips in an irregular corol. 657.

Gaping, *hians*, a gaping corol, opposed to closed.

Gashed, *incisus* s. *dissectus*. See Incised.

Gem, *gemma*. 1151. See Bud.

Geminate, *geminatus*. p. 143.

Gemmaceous, *gemmaceus*. p. 67.

Gemmation, *gemmaio*. 1145.

Gemmification, *gemmaificatio*, the formation of buds or gems.

Gemmiparous, *gemmaiparus*, producing buds.

Geniculate, *geniculatus*. 45.

Generic, *genericus*. A Generic character is the definition of the genus. It is of three kinds, *Factitious*, *Essential*, and *Natural*. See *Factitious*, &c.

A generic name is applied to all the plants of the same genus, or family. The Specific name is added to this, in order to distinguish one species from the others of the same genus. A Plant is perfectly named, when it has both a generic and specific name.

Genus, *genus*, a subdivision of an Order.

Germen, *germen*. 825.

Germination, *germinatio*. 1259. 1270.

Gibbous, *gibbus*. 256.

Gigartoid, *gigartoides*. page 135.

Gill, *lamella*. The thin plates, observed on the under surface of the pileus of an *Agaric*, are named *Gills*. p. 87.

Gland, *glandula*. 370.

Glandless. See *Eglandulous*.

Glandulation, *glandulatio*.

Glass-shaped, *cyathiformis*. 646.

Glaucous, *glaucus*. p. 87.

Globular, *globosus*. 11. 500. 560. 641. 882. p. 134.

Glomerate, *glomeratus*. 506.

Glomerule, *glomerulus*, a small roundish head of flowers.

Glossy, *nitidus*. 216.

Glume, *gluma*. 594.
 Glumose, *glumosus*, having
 glumes.
 Gluten, *gluten*. 1207.
 Glutinosity, *glutinositas*. 377.
 Glutinous, *glutinosus*, besmeared
 with slippery moisture.
 Gnomonic, *gnomonicus*. p. 173.
 Goatish, *hircosus* s. *hircinus*
 1309. p. 87.
 Gourd, *pepo*. p. 118.
 Grain. See *Coccum*.
 Gramina, the fourth of the Natural
 Orders; the fifth family,
 and the 2d nation in the general
 divisions of the Vegetable Kingdom,
 given by Linnaeus. See Vol. II. p. 310.
 Granulated, *granulatus*. 16.
 Granulation, or Granule, *acinus*,
 one of the constituent parts
 of the fruit of a *Raspberry*,
 &c. p. 117.
 Greenish, *virescens* s. *subviridis*.
 p. 87.
 Green, *viridis*. 1335.
 Grey, *griseus*, &c. p. 87.
 Grossification, *grossificatio*. 1273.
 Gruinales (from *grus* a crane),
 the name of the 14th Natural
 Order. See Vol. II. p. 319.
 Grumose, *grumosus*. p. 155.
 Gymnospermia (from *γυμνος* naked,
 and *σπέρμα* seed), the name
 of the 1st Order of the Class
 Didynamia. See page 60.
 Gymnospermous, *gymnospermus*,
 having naked seeds.
 Gymnothecium (from *γυμνος* naked,
 and *θεκη* case), the name
 of Persoon's 2d Class. See
 Vol. II. p. 291.
 Gynandria (from *γυν* woman,
 and *ανδρ* man), the name of
 the 20th Class in the Linnean
 System. See page 59.

Gynandria is also the name of an
 Order. See page 62.
 Gynandrous, *gynandrus*, having
 the stamen or stamens attached
 to the pistil. 704.

HAB.

Habit, *habitus*. p. 45.
 Habitual, *habitualis*. The habitual
 character is taken from the
 port, or general external appearance
 of plants, viz. from their
 placentation, radication,
 ramification, intortion, foliation,
 stipulation, pubescence, inflorescence,
 &c. These, tho' insufficient in
 themselves, often make a plant
 known at first sight. Many of the
 Natural Orders as the *Umbellatae*,
Verticillatae, &c. are instantly
 known from this general similitude
 in their appearance.
 Hair, *capillus* the 12th of a
 line.
 Hair, *pilus*, 356.
 Hair-bearing, or Hair-pointed,
pilifer s. *piliger*. p. 66. the leaf
 terminating in a hair.
 Hairy, *pilosus*. 241.
 Halved, *dimidiatus*. 501. 618.
 p. 86.
 Hand, *palma*. 1353.
 Hard, *durus*. p. 103.
 Harvest, *messis*. 1275.
 Hastate, *hastatus*. 180.
 Hatchet-shaped, *dolabriformis*.
 271.
 Head, *capitulum*. 469.
 Heaped together, *coacervatus*. p.
 275.
 Hederaceæ, (from *hedera* ivy),
 the name of the 46th Natural
 Order. See Vol. II. page
 341.
 Helmet, *galea*. 649.

Helmetted, *galeatus*, furnished with a helmet.
 Hemispherical, *hemisphaericus*, in the form of half a globe.
 Hepatic, *hepatici*. See page 64.
 Hepaticæ, the name of the 4th Order of the Class Cryptogamia, according to Schreber. See Vol. II. p. 260.
 Heptagynia (from *ἑπτά* seven, and *γυνή* woman), the name of an Order. See page 60.
 Heptandria (from *ἑπτά* seven, and *ἀνδρ* husband), the 7th Class in the system of Lin. p. 58.
 Heptandrous, *heptandrus*, having seven stamens.
 Herb, *herba*, that part of a vegetable, which arising from the root, and terminated by the fructification, comprehends the trunk, leaves, fulcres, and hybernacle.
 Herbaceous, *herbaceus*. 23. p. 154.
 Hermaphrodite, *hermaphroditus*. 1199.
 Hesperideæ (from *Hesperides*), the name of the 19th Natural Order. See Vol. II. p. 322.
 Heterophyllous, *heterophyllus*. p. 163.
 Hexagynia (from *ἕξ* six, and *γυνή* woman), one of the Orders in some of the classes of the Linnean System. See p. 60.
 Hexagynous, *hexagynus*, having six pistils.
 Hexandria (from *ἕξ* six, and *ἀνδρ* husband), the 6th Class in the Sexual System. See p. 58.
 Hexandria is also the name of an Order. See page 61.
 Hexandrous, *hexandrus*, having six stamens.
 Hirsute, *hirsutus*, shaggy. 735

Hispid, *hispidus*. 73. 243.
 Hoariness, *pruina*. p. 146.
 Holeraceæ (from *ὄλος* a pot-herb), the name of the 12th Natural Order. See Vol. II. p. 318.
 Hollow, *cavus*. p. 118.
 Homophyllous, *homophyllus*. p. 163.
 Honey-colour, *melinus*. p. 138.
 Honey-combed, *favosus*. p. 124.
 Hook, *hamus*. 367. 1098. s. *hamulus*. 1206.
 Hooked, *hamosus*, furnished with hooks; or like a hook, *uncinatus*. p. 168. 173.
 Horizontal, *horizontalis*. 18. 134. p. 89. 110. 133.
 Horn, or Spur, *cornu* s. *calcar*, the tubular part of the nectary in some flowers.
 Horn-shaped, or Horned, *cornutus* s. *corniculatus*, in the form of a small horn. 757.
 Horologe, *horologium*. 1282.
 Husk, see Glume.
 Hybernacle, *hybernaculum*, the winter-quarters or-lodge, the covering by which the embryo of the future plant is secured from injury during winter. See Bulb, and Bud or Gem.
 Hybrid, *hybridus*, a mule, produced from two different species.
 Hymenothecium (from *ὑμην* membrane, and *θήκη* case), the name of Persoon's 6th Order. See Vol. II. p. 292.
 Hypocrateriform, *hypocrateriformis*. 644.
 Hypogean, *hypogæus*. p. 165.

ICE.

Ice, *glacies*. 1280.
 Icosandria (from *είκοσι* twenty,

and *avng husband*), the name of the 12th Class in the Linnean System. See page 58.
 Icosandria is also the name of an Order. See page 61.
 Icosandrous, *icosandrus*, having about twenty stamens inserted in the inside of the calyx.
 Imbricated, *imbricatus*. 61. 120. 583. 1112. 1163.
 Imbricating, *imbricans*. 1298.
 Immersed, *immersus*, growing under water. See Submersed.
 Impari-pinnate, *impâri-pinna-tus*, a pinnate leaf terminated by an odd or single leaflet.
 Imperfect, *imperfectus*, applied to a flower implies that it wants either stamens or pistils. p. 171.
 Implicated, *implicatus* s. *implex-us*, matted together, or entangled.
 Inch, *pollex*. 1352.
 Incised, *incisus* s. *dissectus*. An incised leaf has the divisions, or sections, more determinate in their number than the laciniated leaf.
 Inclined, *inclinatus*. p. 71.
 Inclining, *inclinans*.
 Inclosed, or Included, *inclusus*, it is applied to anthers, and signifies inclosed within the corol. 813.
 Including, *includens*. 1290.
 Incomplete, *incompletus*. An incomplete flower is destitute either of the calyx or corol. See page 104. 109. 150. 171.
 Inconspicuous, *inconspicuus*. p. 123.
 Incrassated, *incrassatus*. 444.
 Incumbent, *incumbens*. It denotes leaning against when

applied to a filament, and resting horizontally upon when applied to an anther. 794. p. 167.
 Incurved, *incurvatus* s. *incurvus*. 37. 380. page 71.
 Indentation, *sinus*.
 Indistinct, *obsoletus*.
 Indistinctly, *obsolete*.
 Indusium, *indusium*, a term used by Willdenow to express the integument, which includes the whole flower, and afterwards the fruit in the *Filices*, as in *Equisetum*, *Polypodium*, &c.
 Inferior, *inferus* s. *inferior*. 578. 847. p. 101. 124.
 Inflated, *inflatus*. 559.
 Inflation, *inflatio*. 1210.
 Inflected, *inflexus*. 136.
 Inflorescence, *inflorescentia*. p. 20.
 Infundibuliform. See Funnel-shaped.
 Inserted, *insertus*. 303.
 Integument, *integumentum*. p. 147.
 Interfoliaceous, *interfoliaceus*.—
 Interfoliaceous flowers are placed alternately with, and between the leaves: contrasted with *oppositifolii*.
 Interfoliar, *interfoliaris*, p. 64.
 Intermediate, *intermedius*. p. 101.
 Internal, *internus*. p. 131. 152.
 Internode, *internodium*, the space between one joint and another. The joint, or knot, is properly the articulation, although it is frequently used to denote the intermediate space.
 Interrupted, *interruptus*. 521.
 Interruptedly, *interrupte*. See Pinnate.

Intervalved, *intervalvis*. p. 110.

Interwoven. See Implicated.

Intrafoliaceous, *intrafoliaceus*.
322.

Inverted, *inversus*. p. 133.

Inverting, *invertens*. 1297.

Involucel. See Involucret.

Involucre, *involucrum*. 588.

Involucre is also used by Dr. Smith, to express the cover, or receptacle of the capsules of Ferns.

Involucred, *involucratus*. 495.
p. 113.

Involucret, *involucellum*, a partial involucre. 590.

Involute, *involutus*. 1161.

Involving, *involvens*. 1294.

When the leaflets of a compound leaf approach, during the night, by their tips only, leaving an arch underneath.

Inundatae, the name of the 15th Natural Order. See Vol. II.
p. 320.

Inundated, *inundatus*. 1243.

Irregular, *irregularis*. 638. p.
88. 107.

Isthmus, *isthmus*. 1018.

JOL.

Joint, *articulus*. See Internode.

Jointed, *articulatus*. 9. 83. 277.
944. 958. p. 120.

Jointedly, *articulate*.

Juiceless, *exsuccus*. p. 115.

Juicy, *succosus*.

Juliform, *juliformis*, in the form of a Catkin, or Ament, (*Julus* s. *Amentum*.)

KEE.

Keel, *carina*, the lowest petal of a papilionaceous corol. 660.

Keeled, *carinatus*. 260. p. 169.

Kernel, *nucleus*. 1103. p. 150.

Knee-joint, *geniculum*.

Knee-jointed. See Geniculate.

Knob, *tuber*. A small knob, *tuberculum*. See Tubercle.

Knot, *nodus*. See Internode.

Knotty, *nodosus*, furnished with knots or joints. 990.

Knotless, *enodis*. 80.

LAB.

Labiate. See Lipped.

Labyrinth-form, *labyrinthiformis*.

Lacerated, *lacer*, ragged.

Lacinated, *laciniatus*. 191.
636.

Lactescent, *lactescens*, abounding in a milky juice. p. 85.

Lacunose. See Pitted.

Lacustrian, *lacustris*. 1238.

Lamellated, or Lamellous, *lamellatus*, having thin plates or gills (*Lamellæ*).

Lamina, *lamina*. 633.

Lanceolate, *lanceolatus*. 167.

Lanuginous. See Downy.

Large, *magnus*. p. 137.

Large-flowered, *grandiflorus*.
1188.

Late, *serotinus*. 1264.

Lateral, *lateralis*, 320. 795. p.
84. 128.

Latticed, *cancellatus*. p. 137.

Lax. See Limber.

Lead-colour, *plumbeus*. p. 139.

Leaf, *folium*. See p. 6.

Leafless, *aphyllus*, destitute of leaves.

Leaflet, *foliolum*, the partial or small leaf of a compound leaf.

Leafy, or Leaved, *foliatus* s. *foliosus*, furnished with leaves.

Leaf-like. See Foliaceous.

Leathery. See Coriaceous.

Legume, *legumen*, 961. p. 119.

Leguminose, *leguminosus*. p. 112.
Lenticular, *lenticularis*, lentil-shaped. p. 134.

Leprous, *leprosus*, having a scurfy appearance.

Liber. See Bark.

Lid, *operculum*, the cover of a capsule, which opens horizontally. p. 72.

Lidded, *operculatus*, furnished with a lid.

Ligula. See Vol. II. p. 311.

Ligulate, *ligulatus*. 690.

Limber, *laxus*. 33.

Limbus, 632. the border of a one-petalled corol. It is also used to express the entire border of a many petalled corol.

Line, *linea*. 1350.

Linear, *linearis*. 169. 290.

Linguiform, *linguiformis*, or
Lingulate, *lingulatus*. 267.

Lip, *labium*. 650.

Lipped, *labiatus*. 573.

Liver-coloured, *hepaticus*. p. 87.

Livid, *lividus*. p. 87.

Lobe, *lobus*. The parts, into which some simple leaves are divided, are named lobes.

Lobed, *lobatus*. 184. p. 99. 155. 168.

Locust, *locusta*, the calyx of grasses. See Glume.

Lomentaceæ (from *Lomentum* a colour), the name of the 33d Natural order. See Vol. II. p. 329.

Long, *longus*. 301. 346. 564.

Longitudinal, *longitudinalis*. p. 107.

Loose, *laxus*. See Limber.

Loose, *liber*. p. 88.

Lucid, *lucidus*. 217. p. 137.

Lunate, or Lunulate. See Crescent-shaped.

Luridæ (from *luridus*, of a dusky or livid colour), the name of the 28th Natural Order.

See Vol. II. p. 135.

Lyrate, *lyratus*. 188.

Lytothecium (from *λυω* dissolve, and *θηκη* case), the name of Persoon's 5th Order. See Vol. II. p. 291.

MAL.

Male, *mas* s. *masculus*. 1197.

Manifold, *multiplex*. See Many-rayed.

Many-capsuled, *multicapsularis*. p. 97. See Capsuled.

Many-cleft, *multifidus*. See Cleft.

Many-flowered, *multiflorus*.

Many-leaved, *polyphyllus*.

Many-partible, *multipartibilis*.

Many-parted, *multipartitus*. See Parted.

Many-petalled, *polypetalus*. 628.

Many-podded, *multisiliquosus*. p. 97.

Many-rayed, *multiplex*.

Many-spiked, *polystachios*.

Many-valved, *multivalvis*. 599.

Margin, *margo*, the edge of a leaf, &c.

Marginal, *marginalis*, placed on the margin. p. 110.

Marginate, *marginatus*. p. 138.

Marine, *marinus*. 1240.

Maritime, *maritimus*. 1235.

Marrow. See Pith.

Marshy, *palustris*. 1242.

Maturation, *maturatio*. 1274.

Meadowy, *pratensis*. 1248.

Meal, *farina*.

Mealy, *farinosus* s. *farinaceus*. p. 153.

Measure, *mensura*. p. 85.

Medical, *medicus*. 1366.

Mediterranean, *mediterraneus*.

1236.

Membraned, *membranatus*, flattened like a leaf.

Membranous, *membranaceus*.

78. 254. 293. p. 150.

Meniscoid, *meniscoideus*. p.

135.

Menstrual, *menstruus*. 1305.

Meteorical, *meteoricus*. 1284.

Method, *methodus*.

A Method, or System, is a mode of arrangement, founded on certain circumstances of resemblance in the objects of it.

Many Botanical Methods have been invented, some of which are *Universal*, embracing the whole vegetable kingdom; others are *Partial*, comprehending only one tribe or order of Plants.

They are also distinguished as *Natural* and *Artificial*. *NATURAL* Methods are those, in which the classes are all natural, no plants being admitted into them, except such as are allied to each other, and agree in nature and appearance. *ARTIFICIAL* Methods consist of classes, which comprehend plants, often differing extremely from each other in other respects, but agreeing in their classical character.

Of the various universal methods, given in this place, some are founded on the *Fruit*, as the methods of *Cæsalpin*, *Morison*, *Ray*, *Herman*, *Knaut*, *Boerhaave*, and *Camellus*; some on the *Corol*, as the methods of *Rivin*, *Ludwig*, *Knaut*, *Tournefort*, and *Pontede-*

ra; some on the *Calyx*, as those of *Magnolius*, and *Linnaeus*; some on the *Stamens*, as those of *Linnaeus*, and *Thunberg*; and some are natural methods, as those of *Royen*, *Haller*, *Wachendorff*, *Crantz*, *Wernischeck*, and *De Necker*. The *Natural Orders* of *Linnaeus*, will be found in the end of the second volume: And *Gærtner's* Method in this volume. See pages 186—200.

Those readers, who are desirous of seeing a fuller and more satisfactory account of the above methods, and have not access to the original works, will find the greatest part of them, with their genera subjoined, in *Linnaeus's* *Classes Plantarum*.

Linnaeus has also published, in the same work, the following partial methods, viz.

The *Compositi* arranged by *Vaillant* and *Pontedera*.

The *Umbellatæ* arranged by *Artedi* and *Morison*.

The *Gramina* arranged by *Ray*, *Scheuchzer*, *Micheli*, and *Linnaeus*.

The *Musci* arranged by *Dillenius*, and *Micheli*.

The *Fungi* arranged by *Dillenius* and *Micheli*.

The *Filices* arranged by *Linnaeus*.

None of these partial methods are given here; but *Hedwig's* Arrangement of the *Mosses*, and *Persoon's* Arrangement of the *FUNGUSES*, with the characters of the genera, will be found in these volumes. See vol. I. p. 76—82, and Vol. II. p. 288.

1. CÆSALPINUS'S METHOD,

PUBLISHED IN 1583.

TREES & SHRUBS	} with the cor- cle	{ at the apex of the seed at the base of the seed	1
			2
UNDER- SHRUBS & HERBS.	{	with solitary { seeds berries capsules	3 4 5
		with two { seeds capsules	6 7
		with a triple principle { Not Bulbous Bulbous	8 9
	{	with four seeds	10
		with numerous { flower common, divided, on the tops of the seeds, { <i>Anthemides</i> <i>Cichoraceæ</i> <i>s. Acanaceæ</i>	11 12
		{ flower common, not divided, in- ferior	13
		{ in follicles	14
		{ destitute of both flower and fruit	15

Obs. *Cæsalpinus* was the first true systematic botanist. Availing himself of the hints, thrown out by *Gesner*, for the formation of a Method on the parts of fructification, which had been neglected till his time, he arranged Vegetables according to the Receptacle and Fruit. Hence he is named a *Fructist* by *Linnæus*; and those are styled *Corollists*, *Calycists*, and *Sexualists*, who have taken the corol, calyx, and stamens, as the basis of their respective systems.

Those botanical writers, who have founded their systems on the parts of fructification, are named *Orthodox*. Those, who have founded their methods on the habit, qualities, &c. &c. are styled *Heterodox*.

2. MORISON'S METHOD.

PLANTS. {	LIGNOSÆ (Woody)	<i>Arbores</i> (Trees)	1
		<i>Frutices</i> (Shrubs)	2
		<i>Suffrutices</i> (Undershrubs)	3
		<i>Scandentes</i> (Scandent)	4
		<i>Leguminosæ</i> (Leguminous)	5
		<i>Siliquosæ</i> (Siliquose)	6
		<i>Tricapsulares</i> (Three-capsuled)	7
		<i>A numero capsularum</i> (From the number of the capsules)	8
		<i>Corymbiferæ</i> (Corymbiferous)	9
	HERBACEÆ. (Herbaceous)	<i>Lactescentes, s. Papposæ</i> Lactescent or Pappous	10
		<i>Culmiferæ</i> (Culmiferous)	11
		<i>Umbelliferæ</i> (Umbelliferous)	12
		<i>Tricoccæ</i> (Tricoccous)	13
		<i>Galeatæ</i> (Helmetted)	14
		<i>Multicapsulares</i> (Many-capsuled)	15
		<i>Bacciferæ</i> (Bacciferous)	16
		<i>Capillares</i> (Capillary)	17
		<i>Heteroclitæ</i> (Anomalous)	18

Obs. Morison is a *Fructist*, but has likewise attended to the *corol*, and *habit* of plants, in constructing his system.

3. HERMAN'S METHOD.

Obs. Paul Herman is a Fructist, and has arranged Plants according as they have their seeds naked, or enclosed in a pericarp.

HERBS.	Gymnospermous	{	One-seeded	{	Simple	1		
				{	Compound	2		
		{	Two-seeded	{	Stellate	3		
				{	Umbellate	4		
		{	Four-seeded	{	Rough-leaved	5		
				{	Verticillate	6		
		{		Many-seeded	Many naked sds.	7		
	Angiospermous	{		Bulbous	Three-capsuled	8		
		{	With a Cap- sule	{		One seed-vessel	9	
				{		Two seed-vessels	10	
				{		Three seed-ves- sels	11	
				{		Four seed-vessels	12	
				{		Five seed-ves- sels	13	
				{		With a Silique—Siliquose	14	
				{		With a Legume—Leguminous	15	
		{		Many-capsuled—Many-capsuled	16			
		{	Fleshy	{		Berry-bearing	17	
				{		Pome-bearing	18	
				{		Apetalous	19	
		{	Apetalous	{		Glumose	20	
				{		Naked	21	
{				Mossy	22			
TREES	{	Incomplete	{		Amentaceous	22		
			{	Fleshy	{		Umbilicate	23
					{		Not Umbilicate	24
					{		Fruit dry	25
{	Not Fleshy	{						

4. RAY'S FIRST METHOD.

Obs. RAY was at first a *Fructist*; his original Method consisted of the following twenty-five Classes, and was published in 1682.

ARBORES (Trees)	1
FRUTICES (Shrubs)	2
<i>Imperfectæ</i> (Imperfect)	3
<i>Flore carentes</i> (Having no flower)	4
<i>Capillares</i> (Capillary)	5
<i>Gramineæ</i> (Grassy)	6
<i>Gymnomonospermæ</i> (Having one naked seed)	7
<i>Umbellatæ</i> (Umbellate)	8
<i>Verticillatæ</i> (Verticillate)	9
<i>Asperifoliæ</i> (Rough-leaved)	10
<i>Stellatæ</i> (Stellate)	11
Herbæ { <i>Pomiferæ</i> (Pome-bearing)	12
(Herbs) { <i>Bacciferæ</i> (Berry-bearing)	13
<i>Multisiliquæ</i> (Many-podded)	14
<i>Monopetalæ</i> { <i>uniformes</i> (Monopetalous uniform)	15
<i>difformes</i> (Monopetalous difform)	16
<i>Tetrapetalæ</i> { <i>siliquosæ</i> (Tetrapetalous siliquose)	17
<i>siliculosæ</i> (Tetrapetalous siliculose)	18
<i>Papilionaceæ</i> (Papilionaceous)	19
<i>Pentapetalæ</i> (Pentapetalous)	20
<i>Frumenta</i> (Corns)	21
<i>Gramina</i> (Grasses)	22
<i>Graminifoliæ</i> (Grass-leaved)	23
<i>Bulbosæ</i> (Bulbous)	24
<i>Bulbosis affines</i> , (Allied to the Bulbous)	25

5. CHRISTOPHER KNAUT'S METHOD,

PUBLISHED IN 1687.

HERBS Petalled	{ fruit fleshy	Berry-bearing	1	
		Monopetalous	2	
	{ fruit membranous	Tetrapetalous	{ Regular 3 Irregu. 4	
		Pentapetalous		5
		Hexapetalous	6	
		Polypetalous	7	
		Many-capsuled	8	
		Gymnospermous	9	
		{ fruit naked	Solid	10
			Pappous	11
{	Apetalous		12	
	Stamineous		13	
	Inconspicuous		14	
	Imperfect		15	
HERBS Apetalous	{		Trees	16
		Shrubs	17	

Obs. He adopted Ray's first method, but changed the order of the primary divisions, placing *Herbs* before *Trees*, and *Angiospermous* plants before the *Gymnospermous* ones.

No plants, except those growing about *Hall*, were distributed according to this method.

6. RAY'S SECOND METHOD,

PUBLISHED IN 1703.

PLANTS are

Without Buds, <i>Herbs</i>		Submarine	1
		Funguses	2
		Mosses	3
		Capillary	4
Imperfect			
Perfect			
Dicotyledonous			
Flower Apetalous		Apetalous	5
		Planipetalous	6
Flower Compound		Discoid	7
		Corymbiferous	8
Flower simple		Capitate	9
		Monospermous	10
single		Umbelliferous	11
two together		Stellate	12
four together		Rough leaved	13
very numerous		Verticillate	14
Polyspermous			15
with a pulp		Pomiferous	16
Bacciferous			17
with a membrane		Com- pound	
Multisiliquose			18
Simple		Monopetalous	19
		Di-Tripetalous	20
		Siliquose	21
		Leguminous	22
		Pentapetalous	23
		Floriferous	24
		Stamineous	25
		Anomalous	26
Monocotyledonous			
Of Uncertain family			
Bearing Buds, <i>Trees</i>		Arundinaceous	27
Monocotyledonous			
Dicotyledonous: Flower			
remote from the fruit		Apetalous	28
joined to the fruit		Fruit Umbilicate	29
crowned with a calyx		Fr. not Umbilica.	30
not crowned with the calyx			
dry		Fruit dry	31
siliquose		Fr. Siliquose	32
Uncertain		Anomalous	33

7. BOERHAAVE'S METHOD,

PUBLISHED IN 1710,

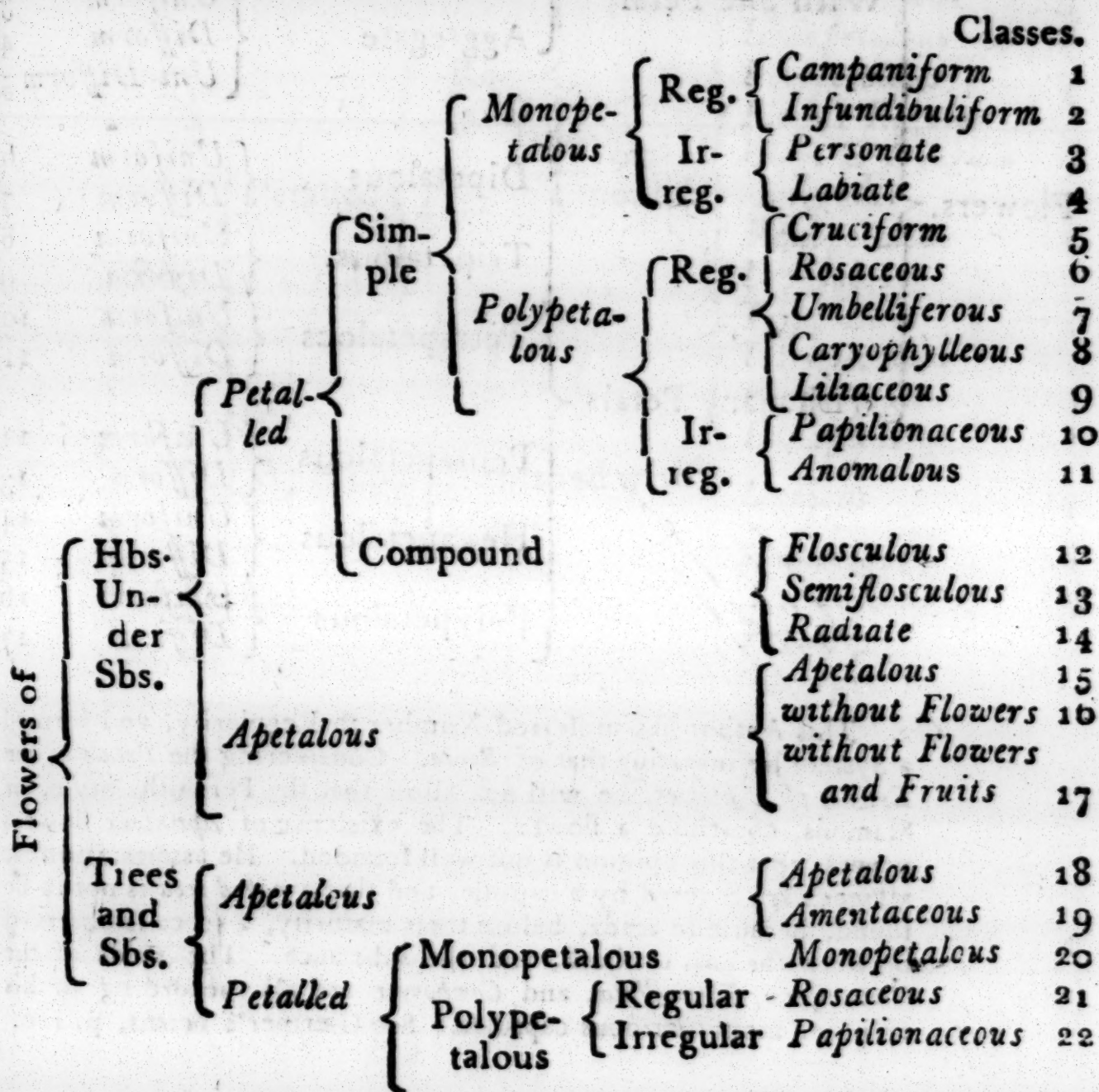
is a Combination of the Methods of Herman and Tournefort, with
the second method of Ray.

	[Imperfectæ (Imperfect)	
	Submarinæ (Submarine)	1
	Terrestres Terrestrial	2
	Capillares (Capillary)	3
	Dicotyledones (Dicotyledonous)	
	Gymnopolyspermæ (Having many naked seeds)	4
	Gymnotetraspermæ { Verticillatæ (Verticillate)	12
	(Having four naked seeds) { Asperifoliæ (Roughleaved)	13
	{ Tetrapetalæ Tetrapetalous)	14
	Gymnodispermæ { Umbelliferæ (Umbelliferous)	5
	(Having two naked seeds) { Stellatæ (Stellate)	11
	Gymnomonosper- { Simplicæ (Simple)	6
	mæ { Planipetalæ (Planipetalous)	7
	(Having one naked seed) { Radiatæ (Radiate)	8
HERBÆ	{ Nudæ (Naked)	9
(Herbs)	{ Capitatæ (Capitate)	10
	Monangia (With one Pericarp)	15
	Diangia (With two Pericarps)	16
	Triangia (With three Pericarps)	17
	Tetragia (With four Pericarps)	18
	Pentangia (With five Pericarps)	19
	Polyangia (With many Pericarps)	20
	Multisiliquæ (Having many Siliques)	21
	Siliquosæ (Siliquose)	22
	Tetrapetalæ Cruciformes (Tetrapetalous Cruciform)	23
	Leguminosæ (Leguminous)	24
	Bacciferæ (Berry-bearing)	25
	Pomiferæ (Pome-bearing)	26
	Apetalæ (Apetalous)	27
	Monocotyledones { Bracteata (Bracteate)	28
	(Monocotyledonous) { Apetalæ (Apetalous)	29
	{ Monocotyledones (Monocotyledonous)	30
ARBORES	{ Apetalæ (Apetalous)	31
(Trees)	{ Amentaceæ (Amentaceous)	32
	{ Monopetalæ Monopetalous	33
	{ Rosaceæ (Rosaceous)	34

10. TOURNEFORT'S METHOD,

PUBLISHED IN 1694.

Obs. Tournefort's System has great Merit. The Classes are taken from the *Regularity* and *Figure* of the *Corol*:—The Orders, from the situation of the Flower, above or beneath the Germen, with the Title of *Pistil*, or *Calyx*, passing into the Fruit.



Obs. The 4th, 5th, 7th, 9th, 10th, 13th, and 14th, Classes, are perfectly Natural ones.

11. THE METHOD OF CHRISTIAN KNAUT,

PUBLISHED IN 1716.

Flowers.	With one Petal	Monopetalous	Uniform	1
			Difform	2
		Aggregate	Uniform	3
			Difform	4
			Uni. Difform	5
	With many Petals	Dipetalous	Uniform	6
			Difform	7
		Tripetalous	Uniform	8
			Difform	9
		Tetrapetalous	Uniform	10
			Difform	11
		Pentapetalous	Uniform	12
			Difform	13
		Hexapetalous	Uniform	14
			Difform	15
		Polypetalous	Uniform	16
			Difform	17

Obs. This Author has preferred Number to Regularity, and formed a System by inverting that of *Rivin*. Considering the *Petals* as the *Essence of a Flower*, he will not allow that the *Perianth*, *Style*, or *Stamens*, constitute a flower. The existence of *Apetalous* flowers proves, that this opinion is not well founded. He asserts also that all seeds are covered by a capsule, and that a *naked seed* is not to be found, because in seeds, before their maturity, a space is observed between the coat or bark, and the substance. The seeds of the *Umbelliferae*, *Verticillatae*, and *Compositae* are all, according to his opinion, monospermous capsules. See *Gärtner's Terms*, p. 110.

LUDWIG'S METHOD,

PUBLISHED IN 1737.

Flowers.	Perfect	Petalled	Re- gular	sim- ple	Monopetalous	1	
					Dipetalous	2	
					Tripetalous	3	
					Tetrapetalous	4	
					Pentapetalous	5	
			com- pound	Hexapetalous	6		
				Polypetalous	7		
				Florets Regular	8		
				Reg. & Irregular	9		
				Irregular	10		
		Irregular	Monopetalous	11			
			Dipetalous	12			
			Tripetalous	13			
			Tetrapetalous	14			
			Pentapetalous	15			
			Hexapetalous	16			
	Imperfect	Apetalous, furnished with a Perianth				Dubious	17
						Stamineous	18
						Amentaceous	19
						Powdery	20

13. PONTEDERA'S METHOD,

PUBLISHED IN 1720.

Obs. He has attempted to combine the systems of Tournefort, and Rivin.

Plants are

{ Uncertain

{ Certain

{ Without buds

{ Destitute of flowers

{ Furnished with flowers

{ Imperfect

{ Perfect

{ Monopetalous

{ Simple

{ Conglobate

{ Polypetalous

{ Bearing buds, flowers

{ Imperfect

{ Perfect

{ Monopetalous

{ Polypetalous

Uncertain

1

Without flowers

2

Imperfect

3

{ Anomalous

4

{ Labiate

5

{ Campaniform

6

{ Hypocrateriform

7

{ Rotate

8

{ Funnel-shaped

9

{ Flosculous

10

{ Ligulate

11

{ Radiate

12

{ Anomalous

13

{ Papilionaceous

14

{ Liliaceous

15

{ Caryophylleous

16

{ Cruciform

17

{ Rosaceous

18

{ Umbellate

19

{ Filamentous

20

{ Apetalous

21

{ Anomalous

22

{ Campaniform

23

{ Rotate

24

{ Funnel-shaped

25

{ Papilionaceous

26

{ Rosaceous

27

Vegetables.

14. MAGNOLIUS'S METHOD,

PUBLISHED IN 1720.

Obs. This Author is a *Calycist*. He has founded his System on the Perianth and Pericarp, both of which he includes under the term calyx.

Vegetables.	Herbs	Calyx External only.	Including	Flower unknown	1
				Flower stamineous	2
			Supporting	Flower monopetalous	3
				Flower polypetalous	4
				Flower compound	5
				Flower monopetalous	6
				Flower polypetalous	7
	Trees	Calyx Internal only	Cal. External & Internal.		8
					9
		Calyx External only		Flower Di or Tripetalous	10
				Flower Tetrapetalous	11
				Flower Polypetalous	12
					13
		Calyx Internal only			14
					15

15. LINNÆUS'S METHOD,

FOUNDED ON THE CALYX.

1. The *Calyx* is the first part of the fructification, which offers itself to our view. It preserves the flower from external injuries, and usually preserves the fruit, although the flower fall off, till its maturity. There is a wonderful diversity of structure in the *Calyx*, much greater than in any other part of the fructification.
2. *Magnolius* alone has founded his method on the *Calyx*. He has only, however, used it for the first foundations, and has immediately had recourse to the Fruit for the rest, that he might (which is very laudable) preserve his classes natural.
3. I have therefore been desirous to propose a quite different method, and to describe in it all the primary species, differences, and properties of the *Calyx*, that students may accustom themselves to the dissection of this part.
4. Let it therefore not be imputed to me, that I have invented a certain new System, since I have only delineated the calyxes according to the general conception, and have studiously broken all the natural Classes, provided I could find clearer distinctions.
5. The *Species* of *Calyx* are six: *Spathæ*, *Glume*, *Ament*, *Perianth*, *Involucre*, *Calyptre*. See PHILOS. BOTANICA.
6. An *Involucre* is either *remote*, or *contiguous*; in this method we take only the *contiguous* one, or the involucre of the umbel alone, which arises from the common receptacle; in a compound umbel there is a double ramification of the receptacle, and therefore a two-fold place for the involucre, whether it be absent or present.
7. The Flowering (*Floribundi*) calyxes have the receptacle diffused within them to their sides, from whence the stamens and corol (if it be present) arise.
8. The Crowning (*Coronatrices*) calyxes are those, which sit on the fruit or germen; the calyx of these, according to Tournefort, passes into the Fruit.
9. Since Nature does not admit a distinction betwixt flowers wanting the calyx (not the corol), and flowers destitute of the corol (not of the calyx), as is very evident from *Daphne*, &c. we have distinguished these hypothetically, according as the external flower continues till the fecundation only be completed, (Class 16.); or till the seeds be perfected (Class 17.).
10. The *Calyptrate* we have omitted on account of the smallness of the number.

KEY OF THE CALYCINE METHOD.

The CALYX is a

[SPATHE	<i>Spathaceous</i>	1
GLUME	<i>Glumose</i>	2
AMENT	<i>Amentaceous</i>	3
INVOLUCRE, whether present or not provided its place be there	<i>Umbellate</i>	4
PERIANTH, the most frequent and diversified		
[<i>Many-flowered</i>	<i>Common</i>	5
[<i>One-flowered</i>		
[<i>Double</i>	<i>Double</i>	6
[<i>Single</i>		
[Producing the flower from its inside	<i>Flowering</i>	7
[Sitting on the germen like a crown	<i>Crowning</i>	8
[Receiving the germen in its bosom		
[Perianth distinct from the corol		
[Of a <i>different</i> structure, or form from the corol	<i>Anomalous</i>	9
[Of a <i>double</i> form, different in different flowers of the same plant	<i>Difform</i>	10
[<i>Uniform</i> with the corol		
[<i>Falling off</i> with the flower or before	<i>Caducous</i>	11
[<i>Persisting</i> till the fruit be fully formed		
[Circumference equal, bear- ing one petal	<i>Equal Monopetalous</i>	12
[more petals	<i>Equal Polypetalous</i>	13
[Circumference unequal, with one petal	<i>Unequal Monopetal.</i>	14
[more petals	<i>Unequal Polypetal.</i>	15
[Perianth or Corol falling off, when the floescence is perfected	<i>Incomplete</i>	16
[when the fruit is perfected	<i>Apetalous</i>	17
None of the five above-mentioned, (more rarely a calypstre)	<i>Naked</i>	18

16. LINNÆUS'S SEXUAL METHOD.

FLOWERS

Visible, all the parts distinct ;

Stamens and Pistils in the same flower,

Stamens not cohering with each other, or with the pistil,
equal, or without any certain proportion,

Number

Stamen single	<i>Monandria</i>	1
Stamens two	<i>Diandria</i>	2
— three	<i>Triandria</i>	3
— four	<i>Tetrandria</i>	4
— five	<i>Pentandria</i>	5
— six	<i>Hexandria</i>	6
— seven	<i>Heptandria</i>	7
— eight	<i>Octandria</i>	8
— nine	<i>Enneandria</i>	9
— ten	<i>Decandria</i>	10

Number and Insertion

Stamens twelve (to 19) inserted in the receptacle	<i>Dodecandria</i>	11
— more (often 20), inserted in the calyx	<i>Icosandria</i>	12
— more, inserted in the receptacle	<i>Polyandria</i>	13

unequal, two constantly shorter,

Stamens four, two longer. *Didynamia* 14Stamens six, four longer. *Tetradynamia* 15

Stamens cohering with each other or the pistil.

<i>Filaments</i> united into one body	<i>Monadelphica</i>	16
<i>Filaments</i> united into two bodies	<i>Diadelphia</i>	17
<i>Filaments</i> united into three or more bodies	<i>Polyadelphia</i>	18
<i>Anthers</i> united into a cylinder	<i>Syngenesia</i>	19
Stamens united with, or sitting on the pistil	<i>Gynandria</i>	20

Stamens and Pistils in distinct flowers

On the same plant	<i>Monoecia</i>	21
On two distinct plants	<i>Dioecia</i>	22
In some flowers separate, in others together	<i>Polygamia</i>	23

Scarcely visible, the parts not distinct *Cryptogamia* 24

Obs. Another Key of the sexual system is here given, as it is less complex, and more easily understood, than that which occurs at page 57.

17. THE SEXUAL SYSTEM OF LINNÆUS,

altered by

PROFESSOR THUNBERG.

FLOWERS visible to every one,

Stamens not cohering with each other,

All of an equal, or indeterminate length,

Number

One

Monandria 1

Two

Diandria 2

Three

Triandria 3

Four

Tetrandria 4

Five

Pentandria 5

Six

Hexandria 6

Seven

Heptandria 7

Eight

Octandria 8

Nine

Enneandria 9

Ten

Decandria 10

Number and Insertion

Twelve, inserted in the Recepta. *Dodecandria* 11Twenty, inserted in the Calyx *Icosandria* 12More, inserted in the Receptacle *Polyandria* 13

Two constantly shorter than the rest

Two longer

Didynamia 14

Four longer

Tetradynamia 15

Stamens cohering with each other

Filaments united into one set

Monadelphias 16

_____ into two sets

Diadelphia 17

_____ into more sets

Polyadelphia 18

Anthers united

Syngenesia 19FLOWERS scarcely visible to the naked eye *Cryptogamia* 20

Obs. Four Classes *Gynandria*, *Monoecia*, *Dioecia*, and *Polygamia*, are incorporated with the others.

18. ROYEN'S NATURAL METHOD,

PUBLISHED IN 1740.

PLANTS	Monocotyledonous, Calyx	Common	Ament Involucre Perianth, Anthers connate — Anthers distinct	Three celled, seeds solitary	One absent	Manifest, Calyx & Corol	Both present Filaments	proper- tionate	free, com- par'd with the corol	Inconspicuous Substance	Herbaceous Stony	Differ- ent Stamens	Fruit	Proper Calyx	Spathaceous None Glumose	Palme Lilia Gramina Amentaceæ Umbellatæ Compositæ Aggregatæ Tricoccæ Incomplete Fructifloræ Calycifloræ Ringentes Siliquosæ Columniferæ Leguminosæ Oligantheræ Diplosantheræ Polyantheræ Cryptantheræ Lithophyta	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

MET.

19. HALLER'S NATURAL METHOD, 1742.

<i>Fungi</i> (Funguses)	1
<i>Musci</i> (Mosses)	2
<i>Epiphyllouspermæ</i> (Epiphyllouspermous)	3
<i>Apetalæ</i> (Apetalous)	4
<i>Gramina</i> (Grasses)	5
<i>Graminibus affines</i> (Allied to the Grasses)	6
<i>Monocotyledones Petaloideæ</i> (Monocotyledonous Petalled)	7
<i>Polystemones</i> (Stamens much more numerous than the petals)	8
<i>Diplostemonæ</i> (Stamens twice as many as the petals)	9
<i>Isostemonæ</i> (Stamens equal in number to the petals)	10
<i>Mejostemonæ</i> (Stamens fewer than the petals)	11
<i>Staminibus sesquialteris</i> (Stamens half as many more than the petals)	12
——— <i>sesquiteritiis</i> (Stamens one third more than the petals)	13
——— <i>quatuor, ringentes</i> (Stam. four, ringent)	14
<i>Congregatæ</i> (Aggregate and Compound)	15

Obs. For the Second method of Haller, see Hist. Stirp. Indig. &c. published in 1768.

20. WACHENDORFF'S METHOD, 1747.

<i>Gymnospermæ</i> (Gymnospermous)	1
<i>Homojodiperianthæ</i> (Having two equal Perianths)	2
<i>Anomojodiperianthæ</i> (Having two unequal Perianths)	3
<i>Pollaplostemonopetalæ</i> (Having more stamens than Petals)	4
<i>Anisostemonopetalæ</i> (Stamens and Petals unequal in length)	5
<i>Cylindrobasiostemonæ</i> (Filaments united into a cylinder at the base)	6
<i>Dimacrostemonæ</i> (Stamens four, two long and two short)	7
<i>Tetramacrostemonæ</i> (Stamens six, four long, two short)	8
<i>Distemonopleantheræ</i> (Filaments united at the base into two bodies)	9
<i>Eleutherantheræ</i> (Anthers free, as in Aggregate Flowers)	10
<i>Cylindrantheræ</i> (Anthers united into a cylinder)	11
<i>Monoperianthæ</i> (Apetalous)	12
<i>Monophythanthæ</i> (Monoicous)	13
<i>Diphythanthæ</i> (Dioicous)	14
<i>Acalyces</i> (Destitute of a calyx)	15
<i>Calycinæ</i> (Calycine, having a calyx and one cotyledon as <i>Funcus.</i>)	16
<i>Spathaceæ</i> (Spathaceous)	17
<i>Glumosæ</i> (Glumose)	18
<i>Cryptanthæ</i> (Flowers concealed)	19

21. CRANTZ'S METHOD,

PUBLISHED IN 1766.

1. *Cryptanthæ* (Flowers Obscure)
2. *Incompletæ* (Incomplete)
3. *Compositæ* (Compound)
4. *Gramina* (Grasses)
5. *Palmæ* (Palms)
6. *Liliaceæ* (Liliaceous)
7. *Ringentes* (Ringent)
8. *Papilionaceæ* (Papilionaceous)
9. *Cruciformes* (Cruciform)
10. *Umbelliferæ* (Umbelliferous)
11. *Columniferæ* (Columniferous)
12. *Calycifloræ* (Calyx-flowered, i. e. the Stamens and often the petals inserted in the Calyx)
13. *Fructifloræ* (The Fruit placed beneath the flower)
14. *Pauci-stamineæ* (Having few Stamens)
15. *Multi-stamineæ* (Having many Stamens)

22. WERNISCHECK'S METHOD,

PUBLISHED IN 1766.

FLOWERS	Monopetalous	Simple	Border of the Corol Two-lipped	1
			Four-cleft	2
			Five-cleft	3
			Six-cleft	4
			Anomalous	5
		Compound	Tubular	6
			Ligulate	7
			Radiate	8
	Polypetalous		Petals 2, 4, & 8	9
			Petals 4 Cruciform	10
			Petals 3 and 6	11
			Petals 5 and 10	12
			Umbellate	13
			Papilionaceous	14
			Stamens more than ten	15
			Columniferous	16
	Apetalous		Calyx Corolline	17
			— Rude or None	18
			Grassy	19
			Clandestine	20

30. THE SYSTEM OF DE NECKER.

1. *Actinophytum* (Flowers compound, radiate)
2. *Glossariphytum* (Flowers compound, florets all lingulate)
3. *Siphoniphytum* (Flowers compound, florets all tubular)
4. *Psydomorphytum* (Flowers crowned, counterfeiting the compound Flowers)
5. *Sphanidophytum* (Fruit or Seed inferior, crowned with a Pappus, &c. &c.)
6. *Gitonophytum* (Fructific. disposed almost like that of *Scadiophytum*)
7. *Scadiophytum* (Fructif. umbrella-like, fruit inferior, two-partible)
8. *Phyllastrophytum* (Leaves stellate, fruit inferior)
9. *Dicroophytum* (Filaments forked)
10. *Sygolliphytum* (Flower inseparably agglutinated to the fruit)
11. *Campylophytum* (The superior part of the corol oblique, and spirally twisted)
12. *Trachytophytum* (Rough-leaved, bearing several congregated capsules, which do not open)
13. *Corythophytum* (Corol helmetted, staminiferous)
14. *Chasmatophytum* (Flowers didynamous, irregular, gaping)
15. *Plasyrgophytum* (Flowers didynamous, regular, counterfeiting gaping)
16. *Darinyphytum* (Corol staminiferous, pistil superior, fruit, when dry, bursting spontaneously)
17. *Arcythophytum* (Corol staminiferous, stamens few, fruit superior, pulpy like a Juniper Berry)
18. *Sarcodiphytum* (Calyx staminiferous, stamens numerous, fruit succulent, or fleshy)
19. *Plyrontophytum* (The Side of the Calyx staminiferous, stamens few, flower inferior, fruit superior)
20. *Coryphophytum* (Calyx staminiferous, stamens few, flower superior, fruit inferior)
21. *Catotaphytum* (Stamens few, inserted partly in the claws of the petals, partly in the proper disk)
22. *Aclythrophytum* (Perigynanda single, fruit or seed not included)
23. *Sysellophytum* (Perigynanda single, persisting, coalescing with the seed)
24. *Eredophytum* (Stamens few, and pistil solitary, inserted in the proper disk)
25. *Dapsilophytum* (Stamens numerous; pistil solitary, inserted in the proper disk)
26. *Catizophytum* (Stamens numerous, sitting on a punctiform base on the apex of a peduncle, (not on a Disk,) fruit superior)

27. *Synathrophytum* (Stamens very numerous, fruits numerous, aggregate, opening)
28. *Acascophytum* (Stamens numerous, fruits heaped together, not opening)
29. *Cyrtosiphytum* (Fruits superior, with gibbous cells)
30. *Osariphytum* (Fruit pulpy, berried, generally drupaceous; pistil superior; stamens few, free)
31. *Ypsoophytum* (Fructif. without a disk; stamens few, sitting on the apex of the peduncles)
32. *Phalarsiphytum* (Stamens connected, and disposed in several phalanxes)
33. *Omoplephytum* (Stamens numerous, connected so as to represent a column)
34. *Comizophytum* (Corol smaller, cylindrical, tubular, &c. &c. supporting the stamens)
35. *Chorisophytum* (Stamens commonly few, distinct; flowers not keeled, mostly regular)
36. *Cyteophytum* (Flowers irregular, lower petal keeled, stamens monadelphous, diadelphous, and separable; legume opening, and not opening)
37. *Amorphophytum* (Flow. irregular, fruit siliquose, and leguminous)
38. *Styridophytum* (Flowers cruciform; fruit siliquose)
39. *Brachytophytum* (Flowers, four-petalled, smaller, fruit sili- culose)
40. *Daphnophytum* (Fructific. different, males sitting on the germen, or proper perigynanda)
41. *Synarmophytum* (Sexes united; stamens concealed)
42. *Cratophytum* (Corroborant; stamens generally solitary, fruit inferior; spadix simple and compound)
43. *Ymnodiphytum* (Spathaceous; fruit three-celled)
44. *Gonoophytum* (Stamens six, equal, opposite to the petals; fruit angular, spathe none)
45. *Achyrophytum* (Fructific. glumose, or chaffy)
46. *Chortodiphytum* (Allied to the Achyrophyta in their parts of fructification)
47. *Axonophytum* (Fructif. in the form of an ament; florets covering the common axis)
48. *Lepyrophytum* (Fruit conical, with thick imbricated scales)
49. *Catabophytum* (Submersed)
50. *Emproophytum* (Caustic, Acrid)
51. *Pocilmophytum* (Varying in structure, and inconstant in the number of the stamens)
52. *Sphæroophytum* (Fructif. globular, some having aggregate spherules on the points or back of the frond)
53. *Phryganophytum* (Mossy, having cespitose shoots)
54. *Atrozophytum* (Algose, the fronds accumulated by successive evolution)

Middle-sized, *medius* s. *mediocris*. 300. p. 137.

Mixed, *mixtus*. p. 103.

Milky, *lacteus*, *lactescens* s. *lactifluus*. p. 85. 139.

Minute, *minutus* s. *exilis*. p. 137.

Miscellanæ, the name of the 54th Natural Order. See Vol. II. page 348. And also of the 1st Order of the Class Cryptogamia, according to Schreb. See Vol. II. p. 258.

Moist, *humidus*. 1340.

Molendinaceous, *molendinaceus*. p. 137.

Monadelphia (from *μῑνος* one, and *ἀδελφός* brother), the name of the 16th Class in the System of Linnæus. See page 58.

Monadelphia is also the name of an Order. See page 62.

Monadelphous, *monadelphus*, having the filaments united into a tube.

Monandria (from *μῑνος* one, and *ἀνὴρ* husband), the name of the 1st Class in the Artificial System of Linnæus. See page 58.

Monandrous, *monandrus*, having only one stamen.

Monocotyledonous, *monocotyledonis*, s. *monocotyledoneus*. 1217. p. 162.

Monoecia (from *μῑνος* one, and *οἶκος* house), the name of the 21st Class in the Linnean System. See page 59.

Monoecia is also the name of the 1st Order of the Class Polygamia. See page 62.

Monogamia (from *μῑνος* one, and *γάμος* marriage), the name of one of the Orders of the Class Syngenesia. See page 61.

Monogynia (from *μῑνος* one, and *γυνή* woman), the name of an Order in several Classes. See page 60.

Monoicous, *monoicus*, having male and female flowers on the same individual.

Monopetalous. See One-petalled.

Monophyllous. See One-leaved.

Monospermous. See One-seeded.

Mould, *humus*. 1254.

Mountainous, *montanus*. 1250.

Mouse-colour, *murinus*.

Mouth, *os*, the opening in the tube of a corol.

Mucilaginous, *mucilaginosus*. p. 150.

Mucous, *mucosus*. 1327.

Mucronate, *mutronatus*. 212. p. 73.

Multangular. See Many-angled.

Multicapsular. See Many-capsuled, &c. &c.

Multiplied, *multiplicatus*. 1189.

Multisiliquæ (from *multus* many, & *siliqua* silique), the name of the 26th Natural Order. See Vol. II. p. 325.

Muricated, *muricatus*. 70. p. 117.

Murex. See page 145.

Musci, the name of the 2d Order in the Class Cryptogamia. See p. 63. 64. And the name also of the 56th Natural Order. See Vol. II. p. 349.

They are divided into *Fron-dose* and *Hepatic* by Hedwig.

Mutilated, *mutilatus*. 717. 1187.

NÆ.

Næmatothecium (from *νῑμα* thread, and *θεσν* case), the name of Persoon's 7th Order. See Vol. II. p. 295.

Nail, *unguis*. 1351.

Naked, *nudus*. 56. 214. 494.
503. 655. 814. 1115. p. 74
94. 113.

Narrow, *angustus*. p. 123.

Narrowed, *angustatus*. 654.

Narrow-leaved, *angustifolius*.

Nasty, *teter*. 1313.

Nations, *gentes*, Linnæus (Regn. Vegetab. p. 1.) has divided Vegetables into nine nations.

1. *Palmae*. 2. *Gramina*. 3. *Lilia*. 4. *Herbæ*. 5. *Arbores*. 6. *Filices*. 7. *Musci*. 8. *Algæ*. 9. *Fungi*. This arrangement differs from the distribution of vegetables into families, only in this circumstance, that the *Lilia*, *Herbæ*, and *Arbores* of the former, are included in the *Plantæ* of the latter. See Families.

Natural, *naturalis*. 1359. The NATURAL CHARACTER of a genus, is that, which delivers all the certain characteristic marks of the fructification, and it may therefore be used under any arrangement. The characters, given by Linnæus in the *Genera Plantarum*, are of this kind. They are taken from the number, figure, situation and proportion of the stamens and other parts of fructification, rejecting taste, smell, colour, and size, as less essential, and liable to variation, from soil, climate, &c.—A NATURAL CLASS, or ORDER, is a collection of several genera, agreeing in their parts of fructification, habit, and qualities, e. g. the *Umbellatæ*, &c.

Nauseous, *nauseosus*. 1315.

Navel, *umbilicus*. p. 9.

Navicular. See Boat-shaped.

Neck, *collum*, the upper narrow part of the tube in a monopetalous corol.

Nectariferous, *nectarifer*. 737.

Nectarine, *nectarinus*. 724.

Nectary, *nectarium*. 694.

Nerve, *nervus*, a simple unbranched vessel.

Nerved, *nervosus*. 219.

Nerveless, *enervis*. 223.

Neutral, or Neuter, *neuter*. having neither anther, nor stigma.

Nidorous, *nidorosus*. 1311.

Nidulant, *nidulans*. 1030. p. 133.

Nipple-like. p. 130.

Nodding, *nutans*. 38. 427. p. 71.

None, *nullus*. p. 123.

Notch, *incisura*.

Nucamentaceous, *nucamentaceus*. p. 136.

Nucament, the same with Ament.

Nucleus. p. 150. See Kernel.

Numerous, *copiosi*, *plures*.

Nuptials, *sponsalia*. 1196.

Nut, *nux*. 1102. A Seed covered with a shell. It comprehends the Seeds of Stone-Fruits, as well as what are commonly called Nuts. p. 112.

OBC.

Obconical, *obconicus*, inversely conical.

Obcordate, *obcordatus*, inversely cordate, or heart-shaped. 930.

Oblique, *obliquus*. 34. 141. 622.

Oblong, *oblongus*. 162. p. 134.

Obovate, *obovatus*, inversely ovate.

Obsolete. See Indistinct.

Obtuse, *obtusus*. 204.
 Obverse, *obversus* s. *verticalis*,
 having the base narrower than
 the apex, so that they seem to
 occupy the places of each
 other. p. 131.
 Obvolute, *obvolutus*. 1165.
 Ochrey, or Ochre-coloured,
ochraceus. p. 87. 138.
 Octandria (from *οκτώ* eight, and
αἰνῆ husband), the eighth Class
 in Linnæus's System. See
 page 58.
 Octandria is also the name of an
 Order. See page 61.
 Octandrus, having eight stamens.
 Odour, *odor*. 1307.
 Officinal, *officinalis*. 1365.
 Olive-colour, *olivaceus*. p. 87.
 One-celled, *unitocularis*. 951.
 One-flowered, *uniflorus*. 595.
 One-leaved, *monophyllus*. 552.
 One-petalled, *monopetalus*.
 627.
 One-rowed, *secundus*, 526.
 One-sided, *unilateralis*. 525.
 1219. p. 128.
 One-valved, *univalvis*. 597.
 617.
 One-winged, *unialatus* s. *monop-*
terygius. p. 144.
 Opaque, *opacus*. p. 147.
 Opening, *apertio*. 1287.
 Opening, *dehiscens*. 822.
 Opening horizontally. See Cut
 round.
 Operculate. See Lidded.
 Opposite, *oppositus*. 99. 126.
 p. 106. 110. 131. 153. 167.
 Oppositifolious, *oppositifolius*.
 323.
 Orange, *aurantiacus* s. *auran-*
tius. 1337.
 Orbicular, *orbicularis* s. *orbicu-*
latus. 159. p. 134.
 Orchideæ, the name of the 7th

Natural Order. See Vol. II.
 page 313.
 Order, *ordo*. A subdivision of
 a Class.
 Orgastic, *orgasticus*, 1316.
 Oval, *ovalis*. 161.
 Ovary, *ovarium*. page 69.—
 The Ovary, improperly na-
 med *Germen* by Linnæus, is
 the conceptacle, which serves
 as a base to the style and stig-
 ma, and as an involucre to
 the ovules or seeds. It is the
 essential part of the female
 organs, and is never wanting.
 For a naked vegetable ovum
 is not found, although naked
 seeds may, in a certain re-
 spect, be observed. GÆRTN.
 Ovate, *ovatus*. 160. p. 134.
 Ovule, *ovum*. The vegetable
 egg is contained within the
 ovary, and requires the assist-
 ance of the male sperm to be-
 come a true seed. The num-
 ber of the ovules is sometimes
 greater than that of the seeds.
 This circumstance is necessary
 to be attended to, otherwise a
 false judgement may be form-
 ed of the generic character,
 thus *Lagoecia* and *Hasselquis-*
tia have two ovules, though
 they only perfect one seed:
 hence *Lagoecia* has been im-
 properly removed from the
 UMBELLIFERÆ, and *Hassel-*
quistia improperly separated
 from *Tordilium*. *Quercus* pro-
 duces 6, *Betula*, 2, *Fagus* and
Castanea 12 or 18 ovules,
 yet more than one seed is sel-
 dom perfected. Sometimes
 the rudiments of the ovules
 remain, sometimes not. Some-
 times, though rarely, the ovules

possess parts, which the seeds do not, as the appendages in the ovules of *Fagus*, &c. It much more frequently happens, however, that the seed has accessory parts, which the ovule wants, as Pappus, Crown, &c. GÄRTNER.

PAI.

Pair, *jugum*. Applied to the leaflets of pinnate leaves. See Bijugous and Two-paired, &c.

Pairs, *gemini*, two from the same point. 317.

Palate, *palatum*, a prominency in the throat of a ringent or personate corol, or a process of the lower lip, extending towards the upper, and closing the gape or opening.

Pale, *pallidus*.

Paleaceous. See Chaffy. p. 134.

Palmæ. The 1st nation, and the 6th family in the arrangements of vegetables by Linnæus. In his Artificial System they constitute an Appendix. In his Natural Orders they take the lead. See page 59, and Vol. II. p. 307.

Palmate, *palmatus*. 14. 187.

Panduriform, *panduræformis*. 182.

Panicle, *panicula*. 466.

Panicled, *paniculatus*. 91.

Paper-like, *chartaceus*. p. 147.

Papilionaceæ (from *papilio* a butterfly) the name of the 33d Natural Order. See Vol. II. p. 327.

Papilionaceous, *papilionaceus*. 662

Papillous. See Pimpled. p. 138.

Pappus, *pappus*. 1093. 1204. p. 139.

Papulous, *papulosus*. 234.

Parabolic, *parabolicus*. 163.

Parallel, *parallelus*. 959. p. 110.

Paraphysis, *paraphysis*. p. 69.

Parasitical, *parasiticus*, growing on some other plant. 1258.

Parched, *aridus*. 1341.

Parenchyma. p. 161.

Parietal, *parietalis*. p. 107. 109. 128.

Parted, *partitus*. 185. p. 110. 167.

Partial, *partialis*. 399. 457. 590. p. 100.

Partible, *partibilis*. p. 98.

Partition. See Dissepiment.

Pasture, *campestris*. 1249.

Patelliform, *patelliformis*. p. 172.

Patulous, *patulus*, the same as Spreading.

Pear-shaped. See Pyriform.

Pectinate, *pectinatus* s. *pectiniformis*, comb-like.

Pedate, *pedatus*. 281.

Pedatifid, *pedatifidus*, bearing the same relation to pedate, that *pinnatifid* does to *pinnate*, the parts of the leaf not being separated to the rib.

Pedicel, *pedicellus*. 401.

Pedicelled, *pedicellatus*. 849. 1001.

Peduncle, *pedunculus*. p. 70.

Peduncled, *pedunculatus*. 477. 493.

Peduncular, *peduncularis*. 350.

Peltate, *peltatus*. 149.

Pellucid, *pellucidus*.

Pencil-form, *penicilliformis*, applied to the stigma, &c.

Pendulous, *pendulus*. 430. p. 71. 127.

Pennate, *pennatus*. A pennate Shoot of a Moss is one, which has alternate or opposite leaflets attached on both sides to the rachis, or mid-rib,

Pentacoccus. See Five-grained.

Pentagonal. See Five-cornered.

Pentagynia (from *πεντε* five, and *γυνή* woman), the name of one of the Orders in the fifth, and several other classes in the Linnean System. See page 60.

Pentagynous, *pentagynus*, having five pistils.

Pentandria (from *πεντε* five, and *ανδρ* man), the name of the 5th Class. See page 58.

Pentandria is also the name of an Order. See p. 61.

Pentandrous, *pentandrus*, having five stamens.

Pentapetalous. See Five-petalled.

Pentaphyllous. See Five-leaved.

Peppery *piperatus*. p. 85.

Perennial, *perennis*. 3. 275.

Perfect, *perfectus*, having both stamen and pistil. p. 171.

Perfoliate, *perfoliatus*. 155.

Perforated, *perforatus*. 1218. p. 109.

Perianth, *perianthium*. 544.

Pericarp, *pericarpium*. 918. p. 110.

Perichæcium, *perichæcium*, the calyx or involucre surrounding the flowers and the base of the fruit-stalk, or capsule of the Mosses. See page 66.

Perigonal, *perigoniale*. See p. 68.

Perigonium (from *περι* about, and *σπρος* seed). See page 67.

Hedwig employs this term in preference to Calyx and Corol, because where there is only one covering for the stamens, and pistils, or where there are more than two, it is not possible to determine which is a Calyx, and which

a Corol. When there are two coverings, he calls one the *internal*, the other the *external* perigonium, and when there are three, he names the third the *intermediate* perigonium. See Vol. II. p. 312. Perigynanda is used in the same way by Necker, as Perigonium by Hedwig.

Peripheral, *periphericus*. p. 174.

Peristome. *peristoma*. p. 73.

Permanent. See Persisting.

Perpendicular, *perpendicularis*. 17.

Perpetual, *perpetuus*. 1302.

Persisting, *persistens*. 274. 326. 548. 581. 687. 874. 916. p. 140.

Personatæ (from *persona* a mask). the name of the 40th Natural Order. See Vol. II. p. 335.

Personate, *personatus*. 658.

Pertused, *pertusus*. See Punched.

Pervious, *pervius*. 656.

Petal, *petalum*. 629.

Petalled. See One-petalled, &c.

Petaliform, *petaliformis*, like a petal.

Petaline, *petalinus*. 696.

Petal-less. See Apetalous.

Petaloid, *petaloideus*, resembling a petal.

Petiole, *petiolus*. 289.*

Petiolar, *petiolaris*. 349. 1152.

Petioled, *petiolatus*. 148.

Petiolule, *petiolulus*, a partial petiole.

Phyllophorous, *phyllophorus*. p. 163.

Pileate, *pileatus*, having a pileus.

Pileus, the upper expanding part of a fungus, supporting the fructifications. p. 85.

Pimpled, *papillosus*. 233.
 Pinna, the segment, leaflet, or division of a compound leaf.
 Pinnate, *pinnatus*. 282.
 Pinnatifid, *pinnatifidus*. 189.
 Pinnulate, *pinnulatus*, when each pinna is subdivided.
 Pinnule, *pinnula*, the subdivision of a pinna.
 Piperitæ (from *piper* pepper, the name of the 2d Natural Order. See Vol. II. p. 309.
 Pistil, *pistillum*. 824.
 Pistillaceous, *pistillaceus*. 699.
 Pistil-bearing, or Pistilliferous, *pistillifer*.
 Pith, *medulla*, the innermost vesicular substance of the trunk, or branch. This part is not thought to be so important, by other writers, as by Linnæus.
 Pithy, *inanis*. 28.
 Pitted, *lacunosus*. 230. p. 169.
 Placentation, *placentatio*. 1214.
 Plaited, *plicatus*. 251. 899. 1166.
 Plumose. See Feathery.
 Plumule, *plumula*. 1089. p. 174. See Corcle.
 Poisonous, *virosus*. 1317.
 Polished, *lævigatus*. p. 115. 137.
 Pollen, *pollen*. 823.
 Polyadelphia (from *πολυς* many, and *ἀδελφός* brother) the name of the 18th Class in the Linnean System. See page 59.
 Polyadelphous, *polyadelphus*, having the filaments united into more than two sets.
 Polyandria (from *πολυς* many, and *ἀνὴρ* husband), the name of the 13th Class. See page 58.

Polyandria is also the name of an Order. See page 61.
 Polyandrous, *polyandrus*, having many stamens, inserted in the receptacle.
 Polycotyledonous, *polycotyledonis* s. *polycotyledoneus*. 1228. p. 165.
 Polygamia (from *πολυς* many, and *γάμος* marriage), the name of the 23d Class in the Artificial System of Linnæus. p. 59.
 Polygamia is also the name of several Orders in the Class Syngenesia. See page 61.
 Polygamous, *polygamus*, a plant which has hermaphrodite, and either male or female flowers, or both.
 Polygynia (from *πολυς* many, and *γυνή* wife), the name of an Order in several of the Classes of the Linnean System. See page 60.
 Polygynous, *polygynus*, many-pistilled.
 Pomaceæ (from *pomum* a pome), the name of the 36th Natural Order. See Vol. II. p. 330.
 Pome, *pomum*. 1023. p. 118.
 Pore, *porus*. p. 90.
 Porule, *porulus*. p. 90.
 Pouch, *perula*. Persoon.
 Powdery, *pulveratus* s. *pulverulentus*. p. 84.
 Preciæ, (*precius* signifies early ripe), the name of the 21st. Natural Order. See Vol. II. p. 322.
 Premorse, *præmorsus*. 7. 207.
 Prickle, *aculeus*. 378. p. 901. 45.
 Prickly, *aculeatus*. 74. 244. p. 125.
 Primordial, *primordialis* s. *primoterus*. p. 64.

Prismatic or Prism-shaped, *prismaticus*, of the same thickness throughout, with several flat sides.

Procumbent, *procumbens*. 40.

Projecting, *exsertus*. A projecting anther is one not included in the corol.

Proliferous, *prolifer*. 84. 458. 1191.

Prominent, *prominens*.

Prominulous, *prominulus*, somewhat prominent.

Prone, *pronus*. See Disk.

Prop. See Fulcre.

Propago. 1104. A name given to the seed of a moss by Linnaeus, who supposed it had a naked corcle, without a cotyledon.

Propagineous, *propagineus*. 1216.

Proper, *proprius*. 551. 591. 695. 1109. p. 101.

Prostrate, *prostratus*, erect with a procumbent base.

Protruded. See Projecting.

Protuberant. See Torose.

Pubescence, *pubes*. 355.* p. 146.

Pubescent, *pubescens*. 871.

Pulley-like, *trachlearis*. p. 172.

Pulpy, *pulposus*. 263. 995.

Punched, *pertusus*, having hollow dots all over the surface.

Punctate, *punctatus*. See Dotted.

Puncticular, *puncticularis*. p. 176.

Puncticulate, *puncticulatus*. p. 124.

Pungent, *pungens*, sharp.

Purple, *purpureus*. 1332.

Purplish, *purpurascens*. p. 87.

Purse-like, *scrotiformis*. 702. 924.

Pustular, *pustulosus*. covered

with vesicular dots.

Putamen, the shell of a nut, or stone fruit. p. 108. 116.

Putamineæ (from *putamen*) the name of the 25th Natural Order. See Vol. II. p. 324.

Pyramidal, *pyramidatus* s. *pyramidalis*. p. 73. 172.

Pyrene, *pyrena*. p. 108.

Pyriform, *pyriformis*. p. 72.

QUA.

Quadrangular, *quadrangularis*, having four prominent angles.

Quadricapsular. See Four-capsuled, &c. &c.

Quality, *qualitas*. p. 53.

Quinate, *quinatus*, having five leaflets on a petiole.

Quinquefid. See Five-cleft, &c.

RAC.

Raceme, *racemus*. 465.

Rachis, *rachis*. 1140. The midrib of a leaf; or the filiform receptacle, which connects the florets in a spike.

Radiating, *radicans*.

Radiate, *radiatus*. 692. 900.

Radical, *radicalis*, from the root. See Root-leaf.

Radication, *radicatio*, the disposition of the root.

Radicle, *radicula*, the fibre of a root. p. 176. See Corcle.

Radiculose, *radiculosus*. p. 65.

Rameous. See Branch.

Ray, *radius*, the circumference of a compound, or aggregate flower; or the spoke of an umbel.

Rayed, *radiatus*. A syngenesious flower is named Rayed or

Radiate, when the florets of the centre are tubular and regular, and those of the circumference ligulate, or naked; or, if tubular, differing from the tubular ones of the centre in size and form.
Raylet, *radiolus*, the small ray of an umbellet.
Ragged, *lacer*. 201.
Receptacle, *receptaculum* s. *thalamus*. 1105. p. 123. 126.
Receptacular, *receptacularis* s. *receptaculaceus*. 700. 723.
Reciprocal, *reciprocus*. 1179.
Reclining, *reclinans*.
Reclined, *reclinatus*. 137.
Rectembryous, *rectembryus*, having a straight embryo.
Recurved, *recurvatus*. 138. p. 71.
Red, *ruber*. 1338.
Reddish, *rubellus* s. *rufus*. p. 87.
Reduced, *reductus*. 1220.
Reflected, *reflexus*. 106. 558.
Refracted, *refractus*, appearing as if it were broken.
Regular, *regularis*. 637. p. 88.
Remote, *remotus*. 125.
Reniform, *reniformis*. 177.
Repand, *repandus*. 200. p. 169.
Resupinate, *resupinatus*, 144. 1180.
Retarded, *cunctans*. 1268.
Reticulated, *reticulatus*. p. 75, 138.
Retroflected, *retroflexus*. 107.
Retrofracted, *retrofractus*. 433.
Retuse, *retusus*. 206.
Reversed. See *Resupinate*.
Revolute, *revolutus*. 139. 355. 1162.
Rhœadææ, (from *Rhæas*, corn poppy) the name of the 27th

Natural Order. See Vol. II. p. 325.
Rhombed, *rhombeus*. 174.
Rhomboidal, *rhomboides*.
Rib, *costa*, the petiole continued through the middle of a leaf. p. 145.
Ribbed, *costatus*, having longitudinal ridges. p. 137.
Ridge, *jugum*. p. 145.
Rigid, *rigidus*. 32. 131.
Rimose. See *Chinky*.
Rind, *cortex*. p. 103. 115.
Ring, *annulus*, the remains of the curtain of an Agaric attached to the stalk, p. 85; and a circular belt in the capsule of a moss. p. 73.
Ringed, *annulatus*. p. 84.
Ringent, *ringens*. 648.
Ringless, *annulo destitutus*. p. 84.
Rodlike, *virgatus*. 90.
Root, *radix*. See p. 1st. A root is composed of pith, wood, outer and inner bark. It consists of the *caudex* or body, and the *radicles*, or fibres which absorb the moisture of the earth.—Linnæus regards, as the root, not only the part which is under ground; but the ascending *caudex*, or trunk of the tree with the branches. According to this idea, the leaves and fructifications are the only parts, not comprehended by the term *root*.
Rooting, *radicans*. 44. 147.
Rooted, *radicatus*.
Root-leaf, *folium radicale*, 110.
Rootless, *absque radice*.
Rootlet. See *Radicle*.
Rosaceous, or *Rose-like*, *rosaceus*. 666.

ROS.

- Rose-colour, or rosy, *roseus*. p. 87. 139.
 Rostel, *rostellum*. 1090.
 Rostrate. See Beaked.
 Rotaceæ (from *rota* a wheel) the name of the 20th Natural Order. See Vol. II. p. 322.
 Rotate, *rotatus*. 645.
 Rough, *asper*, *scaber*. 69. 242.
 Roughened, *exasperatus*.
 Roughish, *subscaber*. p. 117.
 Rough-haired, *hirtus*. 1074.
 Rounded, *rotundatus*. 166.
 Roundish, *subrotundus*. 158. 499.
 Rubbishy, *ruderalis*. 1252.
 Rugged, *scruposus*.
 Rugose. See Wrinkled.
 Ruminant, *ruminatus*. p. 155. 168.
 Runcinate, *runcinatus*. 181.
 Runner, *flagellum reptans*, a shoot putting forth roots and leaves at the end, and thus propagating the plant, as in the strawberry.
 Rust-coloured, *rubiginosus*, s. *rubiginus*, s. *ferrugineus*. p. 87. 138.

SAF.

- Saffron-coloured, *croceus*. p. 87.
 Sagittate, *sagittatus*. 179.
 Salt or saline, *salsus*. 1241. 1328.
 Samara. p. 111.
 Sand, *arena*. 1257.
 Sarcocarpum (from *σαρκος* flesh, and *καρπος* fruit), the name of the third order adopted by Persoon. See Vol. II. p. 291.
 Sarcothecium (from *σαρκος* flesh,

SAR.

251

- and *θηκη* case), the name of Persoon's fourth order. See Vol. II. p. 291.
 Sarmentaceæ (from *sarmentum*, the twig of a vine) the name of the 11th Natural Order. See Vol. II. p. 317.
 Sarmentous, *sarmentosus*, 42. A sarmentous stem is filiform, and almost naked, having only leaves in bunches at the points where it strikes root. It appears to be in shrubs what the runner is in herbaceous plants. See Runner.
 Sattiny. See Silky.
 Scabridæ, (from *scaber*, rough) the name of the 53d Natural Order. See Vol. II. p. 348.
 Scale, *squama*. p. 165.
 Scaly, *squamatus*, s. *squamosus*. 60. 1149.
 Scandent. See Climbing.
 Scape, *scapus*. 21. p. 175.
 Scar, *cicatrice*. p. 130.
 Scariose, *scariosus*. 255.
 Scarlet, *coccineus*. p. 87.
 Scattered, *sparsus*. 97. 118.
 Scitamineæ (from *scitamentum*, a spicy plant); the name of the 8th Natural Order of Linnaeus. See Vol. II. p. 314.
 Scrobiculate, *scrobiculatus*. p. 124. 138.
 Scobiform, *scobiformis*, sawdust-like. 1036. p. 134.
 Scyphiferous. See Cup-bearing.
 Scurfy. See Branny.
 Secondary, *secundarius*. p. 64.
 Sebaceous, *sebaceus*. p. 154.
 Seed, *semen*. 1032. p. 130. See Bud.
 A further distinction betwixt

a *seed* and a *bud* may be taken from their origin. For the production of a seed it is necessary that a new *medulla*, distinct from that of the mother, be formed by proper organs, within proper conceptacles. A bud, on the contrary, is produced from the proper and continuous *medulla*, or substance of the mother. Whenever, therefore, an organ of propagation is produced in a plant, destitute of sexual organs, or at a time when these are not present, it may be referred, without hesitation, to the tribe of buds. See Gærtner.

Seed-coat. See Aril.

Seed-leaf, *folium seminale*. 109.

Segment, *lacinia*. s. *segmentum*.

Semicircular, *semicircularis*. p. 86

Semi-columnar, *semiteres*. 295.

Seminal. See Seed-leaf.

Semination, *seminatio*. 1201.

Sensitive, *sensilis*. 1301.

Senticosæ, (from *sentis* a bramble), the name of the 35th Natural Order. See Vol. II. p. 330.

Separatus, *separate*. p. 100.

Sepiariæ, (from *sepes* a hedge) the name of the 44th Natural Order. See Vol. II. p. 339.

Septal, *septalis*. p. 128.

Septipendulous, *septipendulus*. p. 133.

Serpentine, *serpentinus*, p. 178.

Serrated, *serratus*. 195.

Serrulated, *serrulatus*, finely serrated.

Sessile, *sessilis*. 150. 492. p. 127. 140.

Setaceous, *setaceus*, bristle-shaped.

Sex, *sexus*. See page 48.

The doctrine of the *sexes* of plants is of so early a date as to render it impossible to determine, at this period, to whom the discovery is due.

That notions of a sexual distinction in plants were entertained by the ancients, may be proved from the writings of *Herodotus*, *Theophrastus*, and *Pliny*. A practice, founded upon this supposition of distinct sexual organs in plants, prevailed amongst the Arabians, in the cultivation of their palms and figtrees.

In England, Sir Thomas Milington and Grew, as early as the year 1676, suspected the stamens and pistils to be male and female organs. And at a still more early period (1592) Adam Zalziawisky, a Pole, is said to have supported the opinion of the sexes of plants. About this time Burkhard, physician to the Duke of Brunswick Wolfenbuttel, also published his sentiments upon this subject, in a letter to Leibnitz, and even imparted some hints for the formation of a botanical system, founded on the diversity, observable in the sexual organs of plants. Jungius and Camerarius have likewise written in favour of the sexes of different plants.

None of the above mentioned authors, however, seem to have entertained perfectly correct notions of the uses of the stamens and pistils. We

are indebted to Vaillant, a celebrated French Botanist, for a further advance towards the establishment of this curious doctrine of the sexes of plants. His sentiments were delivered on the 10th of June, 1717, in an academical oration, entitled *Discours sur la structure des fleurs, leurs différences, & l'usage de leurs parties*, which was afterwards translated into Latin, and published by Boerhaave. And it is said that Linnæus first conceived the design of forming his sexual method of Botany from a perusal of Vaillant's work.

Although, from what has been adduced, it is evident, that Linnæus cannot be considered as the discoverer of the sexes of plants, a discovery indeed, to which he does not lay claim, yet he has had the honour of perfectly establishing this singular and important fact by numerous and well conducted experiments, and observations.

From observing that many flowers are destitute of the calyx, and that others want the corol, whilst all have stamens and pistils, Linnæus was led to infer that these are the sexual organs, the organs destined for the formation of fruit.

And he was confirmed in this opinion by several decisive experiments, a few of which I shall here relate from Dr. Smith's translation of the *Dissertation on the Sexes of*

Plants, and must refer my readers to this work for the rest, or to the original printed in the *Amœnitates Academicæ* published by Gilibert.

"In the month of April, I sowed the seeds of hemp (*cannabis*) in two different pots. The young plants came up so plentifully, that each pot contained thirty or forty. I placed each by the light of a window, but in different and remote apartments. The hemp grew extremely well in both pots. In one of them I permitted the male and female plants to remain together, to flower and bear fruit, which ripened in July, and being macerated in water, and committed to the earth, sprung up in twelve days. From the other, however, I removed all the male plants, as soon as they were old enough for me to distinguish them from the females. The remaining females grew very well, and presented their long pistilla in great abundance, these flowers continuing a very long time, as if in expectation of their mates; while the plants in the other pot had already ripened their fruit, their pistilla having, quite in a different manner, faded as soon as the males had discharged all their pollen. It was certainly a beautiful and truly admirable spectacle, to see the unimpregnated females preserve their pistilla so long green, and flourishing, not permit-

ting them to begin to fade, till they had been for a very considerable time exposed, in vain, to the access of the male pollen. Afterwards, when these virgin plants began to decay through age, I examined all their calyces in the presence of several botanists, and found them large and flourishing, although every one of the seed-buds was brown, compressed, membranaceous, and dry, not exhibiting any appearance of cotyledons or pulp. Hence I am perfectly convinced, that the circumstance, which authors have recorded, of the female hemp having produced seeds, although deprived of the male, could only have happened by means of pollen, brought by the wind from some distant place. No experiment can be more easily performed than the above; none more satisfactory in demonstrating the generation of plants."

"I removed all the antheræ out of a flower of *Chelidonium corniculatum* (scarlet horned-poppy), which was growing in a remote part of the garden, upon the first opening of its petals, and stripped off all the rest of the flowers; another day I treated another flower of the same plant in a similar manner, but sprinkled the pistillum of this with the pollen borrowed from another plant of the same species: the result was, that the first flower produced no fruit; but the

second afforded very perfect seed. My design in this experiment was to prove, that the mere removal of the antheræ from a flower is not in itself sufficient to render the germen abortive."

Dr. Smith observes that "This is a fact of great consequence. it shews all the imaginary uses of the stamina and antheræ, as preparing nourishment for the fruit, or removing impurities from it, to be without foundation; and is as decisive in favour of the sexual doctrine as any thing can possibly be."

"*Ixia chinensis*, flowering in my stove, the windows of which were shut, all its flowers proved abortive. I therefore took some of its antheræ in a pair of pincers, and with them sprinkled the stigmata of two flowers, and the next day one stigma only of a third flower; the seed-buds of these flowers remained, grew to a large size, and bore seed; the fruit of the third, however, contained ripe seed only in one of its cells."

Notwithstanding the above very conclusive experiments, the doctrine of the sexes of plants has had many opponents, and has more recently been altogether denied by Spalanzani and Smellie, author of the *Philosophy of Natural History*, to whose works I must beg leave to refer my reader, and also to Rotheram's Letter to Smellie, in vindication of the sexes of plants, and to

De La Croix's *Connubia Florum*, with notes by Sir Richard Clayton.

That distinct male and female organs are to be found in all the plants, belonging to the first 23 classes of Linnæus, few I think can hesitate to admit, after paying due attention to the subject. But it is not by any means equally easy to satisfy ourselves respecting the existence of such organs in the plants, referred to the Class Cryptogamia, on account of their extreme minuteness; hence strong objections have been raised to the extension of this doctrine to the cryptogamous plants, by botanists of great eminence, as *Necker* and *Gærtner*, who admit a sexual difference in the parts of fructification of other plants.

Whether some plants be really *unisexual*, and others *asexual*, I can by no means pretend to determine; but the existence of distinct sexual organs appears to me to have been satisfactorily demonstrated by the researches of the indefatigable *Hedwig* and others, in many plants, referred to the three first orders of the Class Cryptogamia: For example amongst the *Filices*, in *Equisetum* and *Pilularia*; in all the *Musci*; amongst the *Algæ*, in *Jungermannia*, &c.

In the last order (*Fungi*), whether the propagation be made by *buds* or *seeds*, or *both*, is not, I think, sufficiently cleared up at present; but

when we consider the discoveries already made, it does not appear very improbable, that male and female organs may, by the future exertions of some fortunate botanists, be detected in every plant, which has been hitherto supposed not to possess them.

Shady, *nemorosus*. 1246.

Sheath, *vagina* s. *vaginula*, a membrane investing a stem, branch, or peduncle. p. 70.

Sheathed, *vaginatus*.

Sheathing, *vaginans*. 157. p. 170.

Shell, *testa*. p. 147.

Shield, *scutellum*, an orbicular concave fructification with an elevated margin, found on some lichens. See *Target*.

Sclerocarpum (from *σκληρος* hard and *καρπος* fruit), the name of one of *Persoon's* orders. See Vol. II. p. 288.

Shining, *splendens*. p. 137. See *Glossy*.

Shoot, *surculus*, a little branch or twig. It is also used by Linnæus for the branchlets of mosses.

Shoot, *turio*. p. 163.

Shoot-bearing, *turionifer*, p. 163.

Shorey, *littoralis*, 1239.

Short, *brevis*. 299.

Shrivelling, *marcescens* s. *tabescens*. 688. 917.

Shrub, *frutex*. A shrub has several woody stems, is more slender and lower than a tree, and divides nearer the root. But there is no distinct line drawn by nature between them.

Shrubby, *fruticosus*. 25.

Shutting, *reclusio*. 1287.

Sickle-shaped, *falcatus*. 999. p. 168. 173.
 Side, *latus*. p. 132.
 Side-flowered, *lateriflorus*. 471.
 Sigmoid, *sigmoideus*. p. 169. 173.
 Silicle, *silicula*. 955.
 Siliculosa, the name of the first order of the 15th class in the Linnean System. See p. 61.
 Silique, *siliqua*. 955. p. 121.
 Siliquosa, the name of the second order of the class Tetrady-namia. See p. 61.
 Siliquosæ (from *siliqua* a silique) the name of the 39th Natural Order. See Vol. II. p. 334.
 Siliquose, *siliquosus*. p. 112.
 Silky, *sericeus*. 38.
 Simple *simplex*. 81. 454. 520. 541. p. 74. 106. 175.
 Single, *unicus*. 478. 751.
 Sinuated, *sinuatus*. 190.
 Sleep, *somnus*. 1288.
 Slender, *tenuis*. 859.
 Slender-leaved, *tenuifolius*. 1185.
 Slow, *lentus*. 1267.
 Small, *parvus*. p. 137.
 Smooth, *glaber*. 68. 215. p. 137.
 Snowy, *niveus*. p. 139.
 Soft, *mollis*. p. 103.
 Soft hairs, *villi*. 356.
 Soil, *solum*. See p. 50.
 Land, considered as the basis of vegetation, is called *soil*.
Soils consist of different combinations of two or more of the four following primitive earths, namely the calcareous, magnesian, argillaceous, and the silicious.
 By *Calcareous* earths are meant chalk (or carbonate of lime) and all stones that burn to

lime.

Magnesia is never found alone; its distinguishing character consists in affording a bitter salt, generally called Epsom salt, when combined with the sulphuric acid.

Argill (or Alumine) is that part of clay, to which the property of feeling soft and unctuous, and of hardening in the fire, is owing. It dissolves with difficulty in acids, and scarcely ever effervesces with them.

Silicious Earth (*Silex*) is often found in a stony form, such as flint or quartz; and still more frequently in that of a very fine sand.

Iron when reduced to rust (calx or oxyd of iron) is also found in soils.

The *soils* most frequently met with are:

Ist. *CLAY*, which is of various colours, white, grey, brownish red, brownish black, yellow, or bluish. It feels smooth and somewhat unctuous; if moist, it adheres to the fingers, and becomes ductile; if dry, it adheres more or less to the tongue; if thrown into water, it gradually diffuses itself through the water, and separates slowly from it. It does not usually effervesce with acids, unless a strong heat be applied, or it contain a few particles of calcareous or magnesian earth. If heated, it hardens and burns to a brick.

It consists of argill and fine sand, usually of the silicious

kinds, in various proportions, and more or less ferruginous. The argil forms generally from 20 to 75 *per cent* of the whole mass, the sand and calx of iron the remainder.

IIId. CHALK, which, if not very impure, is of a white colour, moderate consistence, and dusty surface, stains the fingers, adheres slightly to the tongue, does not harden, when heated, but burns to lime, in a strong heat, and loses about $\frac{4}{10}$ of its weight. It effervesces with acids, and dissolves almost entirely therein. When dissolved in an acid, it is not precipitated by caustic volatile alkali (ammoniac). This circumstance distinguishes it from magnesia. It promotes putrefaction.

III. SAND. By this is meant small loose grains of great hardness, not cohering with water, nor softened by it. It is generally of the silicious kind, and therefore not soluble in any of the acids except the fluoric.

IV. GRAVEL. It differs from sand chiefly in size. However stones of a calcareous nature, when small and rounded, are often comprehended under this denomination.

V. LOAM denotes any soil, which is less cohesive than clay, and more so than loose chalk. There are several different species of loam, as

1st. *Clayey Loam*, a moderately cohesive soil, in which the argillaceous earth predominates. Its coherence is

greater than that of any other loam, but less than that of pure clay. The other ingredient is a coarse sand, with or without a small proportion of calcareous earth. This kind of soil is called, by the farmers, *strong, stiff, cold, and heavy loam*, in proportion as the clay is more or less abundant.

2. *Chalky Loam*. This is formed of clay, coarse sand, and chalk; the chalk or calcareous earth being the predominant ingredient. It is less cohesive than clayey loams.

3. *Sandy Loam*, in which sand predominates. It is less coherent than either of the two former. The sand, partly coarse, and partly fine, forms from 80 to 90 parts in the hundred of this compound.

4. *Gravelly Loam*. It differs from the last, only in containing a larger proportion of coarse sand or pebbles.

The three last loams are generally called, by farmers, *light or hungry soils*, particularly when they have but little depth.

5. *Ferruginous Loam, or Till*. This is generally of a dark brown, or reddish colour, and much harder than any of the preceding, it consists of clay and calces of iron, more or less intimately mixed. It is distinguishable by its colour, and superior weight. It sometimes effervesces with acids, in which case much of the iron part may be separa-

ted, by pouring upon it, when well dried, a quantity of spirit of salt (*muriatic acid*). The iron may be afterwards separated by the addition of an alkali or chalk.

VI. *Vitriolic Soils*. Some of these are allied to the Ferruginous Loams. They are generally of a blue colour, but redden when heated. When steeped in water they impart to it the power of reddening syrup of violets.

VII. *Boggy Soil*, or *Bogs*. These consist chiefly of the roots of decayed vegetables mixed with clay and sand, and a coaly substance, derived from decayed vegetables. Of bogs there are two kinds; the *black*, containing a larger proportion of clay, and roots more decayed, with mineral oil; and the *red*, in which the roots seem less perfectly decayed, and form the principal part.

VIII. *Heathy Soil*, or that which is naturally productive of heath. Kirwan's Essay on Manures. p. 9—14.

Solid, *solidus*. 27. 1147. p. 118.

Solitary, *solitarius*. 318.

Somewhat shrubby, *suffruticosus*. 24.

Sooty, *fuliginosus*. p. 87.

Spadix, *spadix*. 451. 1141.

Spadiceous, *spadiceus*, having a spadix within a spathe.—It also signifies *bay*. See p. 87.

Span, *spithama*. 1354. A Long

Span, *dodrans*. 1355.

Spathe, *spatha*. 616.

Spathaceous, *spathaceus*. hav-

ing a spathe.

Spathaceæ, the name of the 9th Natural Order. See Vol. II. p. 315.

Spatulate, *spatulatus*. 165.

Species, the subdivision of a genus.

Specific, *specificus*. A *specific character* is a mark, or marks, distinguishing one species from all the others belonging to the same genus. An essential, legitimate, or genuine, *specific name* exhibits the characteristic mark, peculiar to the species.

Sperm, *sperma*, the oily liquid, to which the fecundation of seeds is owing, according to Gærtner, who informs us that it resides in the pollen in all those plants, which have pollen-bearing anthers; and that it is also found in the solid anthers of *Apocynum*, *Cynanchum*, *Asclepias*, and some *Orchideæ*. He further informs us that, if the stigma of a flower be besmeared with oil, and the pollen applied to it, or if the liquor of the pollen be previously dissolved in oil, and applied to the stigma, in either case the fecundation of the seed will take place as well, as if it had been effected by the immediate contact of the sperm, and that there could be no granule of fovilla present in either of these cases. Whence he thinks it evident, that the fecundation is not owing to fovilla, but to the oily liquor of the pollen. Introd. p. 30.

Spiciform, See Spike-like.
 Spike, *spica*. 461.
 Spiked, *spicatus*. 536.
 Spikelet, *spicula*, a subdivision of a spike, a small spike.
 Spike-like, *spiciformis*.
 Spine. See Thorn.
 Spinescent, *spinescens*, becoming hard and thorny.
 Spiral, *spiralis*. 711. p. 169. 173.
 Splitting, *fissilis*. p. 84.
 Spongy, *spongiosus*. p. 126. 148.
 Spoonshaped, *cochleariformis*. p. 169.
 Spotted, *maculatus*. p. 87.
 Spreading, *patens* s. *patulus*. 93. 133. 538. 661.
 Spur, *calcar*. See Horn.
 Spurious, *spurius*. p. 112. 119. 121. 122.
 Spurred, *calcaratus*. 701.
 Spurious, *spurius*. p. 112.
 Spurless, *ecalcaratus*.
 Squarrose, *squarrosus*. 584.
 Stalk, *stipes*, when applied to the funguses. p. 83.
 Stalked. See Stipitate.
 Stalkless, *acaulis*.
 Stamen. 706.
 Stamen-bearing, or Staminiferous, *staminifer*.
 Staminate, *stamineus*. 698. It was used by Ray to denote a flower without a corol.
 Standard, *vexillum*, the uppermost petal of a papilionaceous corol. 664
 Station, *statio*. See p. 49.
 Stellatæ (from *stella* a star), the name of the 47th Natural Order. See vol. II. p. 342.
 Stellate, *stellatus*. 128. 366. p. 141.
 Stem, *caulis*. 19.

Stem-bulb, *bulbus caulinus*. 1150.
 Stem-clasping, *amplexicaulis*. 154
 Stem-leaf, *folium caulinum*. 111.
 Stem-less, *acaulis*.
 Stiff and straight, *strictus*. 31. 130.
 Stigma, *stigma*. 876.
 Sting, *stimulus*. 391.
 Stinging, *urens* s. *pungens*. 76.
 Stipe, *stipes*, when applied to a frond. 22. See also 1094.
 Stipitate, *stipitatus*. 1094. p. 127. 140.
 Stipular, *stipularis*. 1153.
 Stipuled, *stipulatus*. furnished with stipules. 77.
 Stipule-less, *exstipulatus*.
 Stipule, *stipula*. 316.*
 Stock, *caudex*, the stem or trunk of a tree. According to the idea of Linnæus the descending stem (*caudex descendens*) terminates in roots; the ascending stem (*caudex ascendens*) in branches supporting the leaves and fructification.
 Stolon, *stolo*, a sucker or scion, a shoot from the root of a plant by which it may be propagated.
 Stoloniferous, *stoloniferus*. 41.
 Stony, *lapideus*. p. 116. 148.
 Straight, *rectus*. 609. 621. 1002. p. 135. 168.
 Straightish, *rectiusculus*.
 Strait, *arctus*, as the calyx in Syngenesious plants.
 Straw-colour, *stramineus*. p. 87.
 Streaked, *lineatus*. 224.
 Streaks, *striae*.
 Striated, *striatus*, 66. 225. p. 137.
 Striga. 360.

Strigose, *strigosus*. 245.
 Strobile, *strobilus*. 463. 1091.
 Strophiole, *strophiolum*. p. 145.
 Strobilaceous, *strobilaceus*.
 Structure, *structura*. 1213.
 Stuffed, *farctus*. 994. p. 83.
 Style, *stylus*, 853.
 Styptic, *stypticus*. 1324.
 Subdivided, *subdivisus*.
 Suberous. See Cork-like.
 Submarine, *submarinus*.
 Submersed, *submersus*. 145.
 Subulate, *subulatus*. 269.
 Succedaneous, *succedaneus*. p. 64.
 Succulent, *succulentus*. 1021.
 Succulentæ, from *succus* juice)
 the name of the 13th Natural
 Order. See Vol. II. p. 318.
 Sucker. See Stolon.
 Summit, *apex*. See Apex.
 Superaxillary, *superaxillaris*. 488
 Superdecompound, *supradecom-*
positus, more than doubly
 compound.
 Superficial, *superficialis*. p. 130.
 Superior, *superus* s. *superior*.
 577. 846. p. 101. 123.
 Supine, *supinus*. See Disk.
 Suprafoliaceous, *suprafoliaceus*,
 inserted into the stem or
 branch above the leaf, petiole,
 or axil.
 System, *systema*. See Method.
 Sweet, *dulcis*. 1325.
 Syngenesia. (From *σύν* together,
 and *γενεσις* generation. The
 name of the 19th Class in
 the Linnean System. See
 p. 59.
 Syngenesia, is also the name of
 an Order. See p. 62.
 Syngenesious, *syngenesius* s. *syn-*
genesista, having the anthers
 united.

TAI.

Tail, *cauda*. 1097. 1202. p.

148.
 Tailed, *caudatus*. 1064.
 Tail-less, *ecaudatus*.
 Tapering. See Attenuated.
 Target, *pelta*. A flat orbicular
 fructification, found on some
 Lichens.
 Taste, *sapor*. 1318.
 Tawny, *fulvus*. p. 87.
 Tender, *tener*.
 Tendril, *cirrhus*. 346.*
 Tendrilled, *cirrhosus*, 213.
 Tendril-bearing, *cirrhifer*.
 Tergeminate, *tergeminus*. 287.
 Terminal, or terminating, *ter-*
minalis, 385. 607.
 Ternary, *ternarius*. p. 115.
 Ternate, *ternatus*. 280.
 Tessellated *tessellatus*.
 Tetradyamia, (from *τετταρες*
four, and *δυναμις* power). The
 name of the 15th Class in the
 Linnean System. See p.
 58.
 Tetradyamous, *tetradyamus*
 s. *tetradyamicus*, having six
 stamens, two of which are
 constantly shorter than the
 others.
 Tetraedrous, *tetraedrus*, four-
 sided.
 Tetragonal. See Four-corner-
 ed.
 Tetragynia (from *τετταρες* four,
 and *γυν* woman.) The name
 of one of the Orders in many
 Classes. See p. 60.
 Tetrandria (from *τετταρες* four,
 and *ανδρ* husband). The name
 of the fourth class. See
 p. 58.
 Tetrandria is also the name of
 an Order. See p. 62.
 Tetrandrous, *tetrandrus*, hav-
 ing four stamens.
 Thalamus. See Receptacle.

Thaw, *vegetatio*. 1281.
 Thick, *crassus*. 858.
 Thickish, *crassiusculus*.
 Thorn, *spina*. 384. p. 145.
 Thorny, *spinosus*. 75. 198. p. 141.
 Thread, *filum* s. *filamentum*.
 Thread-like. See Filiform.
 Three-capsuled, *tricapsularis*.
 Three-celled, *trilocularis*. 951.
 Three-cleft, *trifidus*. 183.
 Three-cornered, *trigonus*.
 Three-flowered, *triflorus*. 596.
 Three-furrowed, *trisulcus*. 939.
 Three-grained, *tricoccus*.
 Three-leaved, *triphyllus*.
 Three-lobed, *trilobus*. 184.
 Three-nerved, *trinervis*.
 Three-paired, *trijugus*.
 Three-parted, *tripartitus*. 186.
 Three-partible, *tripartibilis*. p. 98.
 Three-petalled, *tripetalus*.
 Three-pointed, *tricuspidatus*.
 See Cuspidate.
 Three-seeded, *trispermus*.
 Three-sided, *triqueter*.
 Three-toothed, *tridentatus*.
 Three-valved, *trivalvis*, 949.
 Three together, *ternus*, 122.
 Three-winged, *trialatus* s. *tripterygerius*, p. 144.
 Throat, *fauz*. 651.
 Thyse, *thyrsus*. 467.
 Tile-coloured, *testaceus*. p. 87.
 Time, *tempus*. p. 51.
 Tomentum. 359.
 Tomentous, *tomentosus*. 71. 237.
 Tongue-shaped. See Lingui-
 form.
 Tooth, *dens*.
 Toothed, *dentatus*. 10. 197.
 716. p. 74. 167.
 Toothlet, *denticulus*.
 Top, *apex*. See Apex.
 Torose, *torosus*. And
 Torulose, *terulosus*, protube-

rant, or somewhat protube-
 rant. 957. 993.
 Touch, *tactus*. 1339.
 Tough, *tenax*.
 Tracheæ. p. 161. See Vessels.
 Transplantation, *exsolatio*. 1276.
 Transverse, *transversus*. 960.
transversalis. p. 110. 121.
 167.
 Trapeziform, *trapeziformis*. 175.
 Tree, *arbor*, a vegetable with a
 single woody trunk.
 Triandria (from *tres* three, and
virg husband). The name of
 the third Class. See p. 58.
 Triandria is also the name of
 an Order. See p. 61.
 Triandrous, *triandrus*, having
 three stamens.
 Triangular, *triangularis*. 172.
 Tribe, *tribus*. The tribes of
 vegetables according to Lin-
 næus (Regn. Veget. 1.) are 3,
 1. *Monocotyledones*, containing
 the *Palmae*, *Gramina*, and
Lilia, the three first nations,
 or casts.
 2. *Dicotyledones*, comprehend-
 ing the *Herbæ*, and *Arbores*,
 the 4th and 5th nations.
 3. *Acotyledones*, under which
 are included the four Crypto-
 gamous Orders, or four last
 nations, viz. *Filices*, *Musci*,
Algæ, and *Fungi*.
 Trichotomous, *trichotomus*,
 dividing by threes.
 Tricoccous, *tricoccus*. It is ap-
 plied to a capsule, and signifies
 that it is swelled out into
 three protuberances, and is
 internally divided into three
 cells, each containing one
 seed, e. g. the capsule of
Euphorbia.
 Tricoccae (from *tres* three and

- coccum* a grain), the name of the 38th Natural Order. See Vol. II. p. 333.
- Tricuspidate. See Three-pointed.
- Tridentate. See Three-toothed.
- Triduous, *triduus*. 1304.
- Trifid. See Three-cleft.
- Trigeminate. See Tergeminate.
- Trigynia (from *tres* three, and *gyn* woman). The name of an Order. See p. 60.
- Trigynous, *trigynus*, having three pistils.
- Trihilatæ, (from *tres* three, and *hilum* an eye or scar) the name of the 23d Natural Order. See Vol. II. p. 323.
- Trijugous. See Three-paired.
- Trinerved. See Three-nerved.
- Trinervate, *trinervatus*. 221.
- Trioecia (from *tres* three, and *oikia* house). The name of the 3d Order of the Class Polygamia. See p. 62.
- Trioicous, *trioicus*, having three houses, or male, female, and hermaphrodite flowers on three individuals of the same species.
- Tripartite. See Three-parted.
- Tripetaloidæ (from *tres* three, and *petalum* petal) the name of the 5th Natural Order. See Vol. II. p. 312.
- Tripetalous. See Three-petalled.
- Triphyllous. See Three-leaved.
- Tripinnate, *tripinnatus*. 289.
- Triple-nerved, *triplinervis*. 222.
- Triply-compound. See Super-decompound.
- Triquetrous, *triqueter*. 55. 265.
- Trispermous. See Three-seeded.
- Triternate, *triternatus*. 288.
- Trivalved. See Three-valved.
- Trivial, *trivialis*. The trivial

- name consists of one word, which is placed after the generic name. It is not restricted by any laws. It is not even necessary, that it should express any one characteristic mark of the plant in question, being frequently taken from the name of some botanist, &c. The genuine or essential specific name expresses the most prominent or characteristic circumstance of the species, and thereby affords an abridged specific character. The *Trivial* is commonly however confounded with the *specific* name. See Specific
- Tropical, *tropicus*. 1285.
- Trumpet-form, *tubæformis*. p. 69.
- Truncated, *truncatus*. 208.
- Trunk, *truncus*. p. 2.
- Tube, *tubus*. 630. p. 89.
- Tubercle, *tuberculum*, a little knob, like a pimple, either spherical, or only convex on the upper side.
- Tubercled, or tubercular, *tuberculatus* s. *tuberculosus*, covered with tubercles. 977. p. 125. 138. 176.
- Tuberous, *tuberosus*. 12.
- Tubular, *tubulatus* s. *tubulosus*, 262. 691. 792. p. 83.
- Tuft, *coma*. 398.
- Tufted, *plumosus*. p. 84. 86.
- Turbinate, *turbinatus*. 586. p. 135.
- Turgid, *turgidus*, swollen. 992. p. 166.
- Turioniferous, *turianifer*. p. 163.
- Twin, *geminatus*. See Didymous.
- Twining, *volubilis*, 48., ascending spirally round a stem or

prop either from right to left, contrary to the apparent motion of the sun, as the *Hop*, *Honeysuckle*, &c.; or from left to right, according to the apparent motion of the sun, as a *Convolvulus*, *Kidney-bean*, &c. To determine this, the spectator is supposed to look towards the south, with the east, of course, on his left hand. Thus stationed, if he observe the stem of a *Convolvulus*, he will find that it twines from the left or east, by the north, towards the west; and that the *Honeysuckle* takes a contrary direction.

Twisted, *tortilis*, like a cord. 610.

Twisted, *tortus*. 670.

Twining, or Torsion, *torsio*. 1174.

Two-capsuled, *bicapsularis*.

Two-celled, *bilocularis*. 951.

Two-cleft, *bifidus*. 183.

Two-coloured, *bicolor*.

Two-edged, *anceps*. 52.

Two-flowered, *biflorus*. 596.

Two-grained, *dicoccus*. 952.

Two-horned, *bicornis*. 757.

Two-lamellated. See Bilamellated.

Two-lipped, *bilabiatus*.

Two-leaved, *diphyllus*. 552.

Two-lobed, *bilobus*. 184. p. 99.

Two-paired, *bijugus*. 283.

Two-parted, *bipartitus*. 186.

Two-partible, *bipartibilis*. p. 98. See Bipartible.

Two-petalled, *dipetalus*. 627.

Two-rowed, *distichus*. 96. 116. 507.

Two-seeded, *dispermus*.

Two-spiked, *distachyus*.

Two together, *binus*. 122.

Two-toothed, *bidentatus*.

Two-valved, *bivalvis*. 598. 619.

Two-winged, *dipterygius*. p. 144.

ULI.

Uliginous, *uliginosus*. 1244.

Umbel, *umbella*. 453. 1123.

Umbellatæ (from *umbella* an umbel), the name of the 45th Natural Order. See Vol. II. p. 339.

Umbellate, *umbellatus*, having the flowers in umbels.

Umbellet, *umbellula*. 420.

Umbelliferous, *umbellifer*, umbel-bearing. See Umbellate.

Umbilicate, *umbilicatus*, having a depression like the navel. 898. p. 86.

Umbilicus. When applied to some fruits it denotes the cavity, where the receptacle of the flower was situated; when applied to a seed, it denotes the part, where the navel-string, or the cord which connects it with the receptacle, is inserted. p. 130.

Umbrella-shaped, *umbraculiformis*. p. 71.

Unarmed, *inermis*, without thorns, or prickles.

Uncinate, *uncinatus*, hooked at the end. See Hooked.

Under-shrub, *suffrutex*, permanent or woody at the base, the annual branches decaying. It is usually of a lower growth than the shrub.

Undulated, *undatus* s. *undulatus*. 252. p. 169.

Unequal, *inaequalis*. 572. 639.

- Unguiculate. See Clawed.
 Ungulate, or hoof-shaped, *ungulatus*.
 Uniform, *uniformis*. p. 88.
 135. 140.
 Unilateral. See One-sided. p.
 128. 153.
 Universal, *universalis*. 456.
 589.
 Unisexual, *unisexualis* s. *aphroditus*. Gartner is of opinion that the greater part, if not all, of the cryptogamous plants are unisexual females, or aphrodites.
 Urceolate, *urceolatus*. 647. 883.
 Use, *usus*. p. 55.
 Utricle, *utriculus*. p. 111. See Bladder.

VAG.

- Vaginal, *vaginalis*. p. 152.
 Vague, *vagus*. p. 128.
 Valve, *valva* s. *valvula*. 948. p.
 105.
 Valved, *valvatus*. See 949. p.
 104.
 Valvipendulous, *valvipendulus*.
 p. 133.
 Variation, *variatio*. 1181.
 Variegated, *variegatus*. p. 87.
 Variety, *varietas*. A plant which has undergone some change from an accidental cause, as soil, climate, &c.
 Various, *varius*. p. 125.
 Vault. See Arch.
 Vaulted. See Arched.
 Veil. See Curtain. p. 85.
 Veiled, *velatus*. furnished with a curtain. p. 84.
 Vein, *vena*, a vessel branching, or variously divided over the surface of a leaf, &c. See p. 91.
 Veined, *venosus*. 227.
 Veinless, *avenis* s. *avenius*. 231.

- Velvety, *velutinus*. p. 86.
 Venoso-reticulated, *venoso-reticulatus*. 973.
 Ventricose, *ventricosus*. 509.
 Ventral, *ventralis*. p. 110.
 Ventriculous, *ventriculosus*, somewhat ventricose.
 Vepreculæ (from *vepres* a brier), the name of the 31st of the Natural Orders. See Vol. II. p. 327.
 Vermicular or Vermiculate, *vermicularis* s. *vermiculatus*. p. 138. 169.
 Vernation, *vernatio*. 1158. 1261.
 Verrucose. See Warty.
 Versatile, *versatilis*. 787.
 Vertex. p. 132.
 Vertical, *verticalis*. 143. p.
 110. 121.
 Verticil, *verticillus*. 470.
 Verticillate, *verticillatus*. bearing verticils. See p. 106. 167.
 Verticillatæ (from *verticillus* a verticil or whirl) the name of the 42d Natural Order. See Vol. II. p. 237.
 Very entire, *integerrimus*. 193.
 Very long, *longissimus*. 302. 681. 729. 810. 854. 1011.
 Very much branched, *ramosissimus*. 89.
 Very numerous, *creberrimus*.
 Very remote, *remotissimus*. 625.
 Very short, *brevissimus*. 298. 344. 682. 730. 811. 855.
 Very simple, *simplicissimus*. 82.
 Very small, *minimus*. 851.
 Vesicle, *vesicula*, a little bladder.
 Vesicular, *vesicularis* s. *vesiculosus*, having small bodies like bladders on the surface.
 Vessels, *vasa*, according to Linnæus, are of three kinds, 1. Succiferous or Sap-vessels,

destined to convey the juices of the plant.

2. *Air Vessels, (Tracheæ,)* for receiving and distributing air.

3. *Utricles*, or small bladders, containing secreted fluids.

By other writers on the anatomy, and physiology of vegetables, the following species of vessels are attributed to them.

1. *The Sap-vessels*, by which the sap or common juice is conveyed from the root to every part of the plant. They are extremely small, and supposed to be without ramifications. Several circumstances, relative to the motion of this fluid, have been ascertained by the experiments of Dr. Walker. By making a number of incisions, about an inch deep, and a foot distant from each other, in a young and vigorous Birch Tree, before the sap began to rise, he found, that it flowed first from the lowest incision, and ascended gradually to the highest, and that, when it had pervaded the whole plant, opening buds appeared, and the incisions ceased to yield any more sap, first in the upper part of the tree, and successively downwards in the lower parts. He observed that, when the mid-day heat was not greater than 40 deg. of Fahrenheit's thermometer, the sap did not ascend at all; when the thermometer was about 45, at noon, the sap only rose about a foot in two days; and that when the

thermometer, at noon, was about 49, or between 46 and 50, the sap ascended about a foot in 24 hours. He found also that the sap moved with greater velocity through young than old branches, and that it flowed more copiously from an inverted branch, when cut, than from an erect one. These circumstances prove, that the sap is propelled upwards by the action of the vessels, that this action is much influenced by heat, and that its ascent cannot be owing to capillary attraction alone, or assisted by the contraction and expansion of air in the air-vessels. In these experiments no sap could be perceived ascending through the pith or bark of the tree: But it rose through the wood, although not so copiously as between the wood and the bark.

2. *The Proper Vessels*. These are said to be larger than the sap-vessels, and less numerous. They contain the proper juice, or blood, which differs very much in different plants, being milky in *Euphorbia*, yellow in *Chelidonium*, &c. &c.

3. *The Air-vessels or Tracheæ*, which are of a larger diameter than the preceding vessels, are formed of thin narrow plates, twisted in a spiral manner, and were formerly believed to contain air only. It appears, however, from the experiments and observations of Reichel and Hedwig, that they are destined to convey juices, as well as air; and on this ac-

count, they have been named pneumato-chymiferous vessels. They are found in the wood, bark, and leaves; in the last of which they are easily rendered conspicuous by breaking them, and pulling the pieces gently asunder.

4. *The Medullary Vessels.*

These are not very properly named vessels, being only the cells constituting the pith or medulla, which appears to be analogous to the cellular texture, or adipose membrane of animals. The principal part or body of the pith, in the dicotyledonous plants, is lodged in the canal formed by the wood in the middle or axis of the vegetable. Except in Elder, and a few other plants, it is in small quantity, and its vessels pass off horizontally from the centre towards the circumference of the plant, like diverging rays.

But in monocotyledonous plants, as *Rushes, Asparagus, &c.* the medullary vessels, according to Desfontaines, do not form diverging rays: The pith is much more abundant, and completely envelops the woody fibres, which are not formed in concentric layers, but are placed without order, and are more distant from each other nearer to the centre of the plant, than towards the circumference.

5. *Absorbent Vessels.* Their office is to imbibe or take up water, gases, earth, carbone, and whatever constitutes the

food of the plant. They appear to be very numerous in the radicles of plants, and on the surface of the leaves; and it is probable that no part, external or internal, is destitute of them. The tracheæ or spiral vessels are considered as absorbents by Dr. Darwin.

6. *Excretory Vessels.* The existence of these on the surfaces of the trunk, branches, leaves, and flowers, is satisfactorily shewn by the experiments of Dr. Hales; who found that a very considerable part of the moisture, absorbed by the roots of plants, passes off by perspiration. And later experiments have shewn that vital air is excreted from the leaves of plants.

Excretions likewise take place, especially during the night, from the roots of plants. And, from the observations of Bruggmans, it appears that the liquids, excreted from the roots of some plants, are injurious and even destructive to other plants, which happen to grow near them: Wheat, for example, is injured, in this way, by *Erigeron Acre*, Oat by *Serratula arvensis*, Carrot by *Inula Helenium*, &c. &c. The roots of some plants, injured by Darnel (*Lolium*) were found, by this author, to assume the appearance of having been preyed upon by an insect. He took a great deal of pains to determine, if this were really the case, but being unable to detect any

insect, and finding, by an experiment made upon *Darnel* and another plant, placed in a glass vessel, that the root of the latter became affected in a similar manner, he concluded that the roots of the other plants had been injured by the juice, excreted from the roots of *Darnel*. *Diss. de Lolio*.

7. *Secretory Vessels*. The office of these vessels is to secrete juices, which are useful in the economy of the vegetable. They are generally accompanied by a glandular apparatus. The anthers may be considered as glands, destined to secrete the pollen or sperm.

Dr. Darwin is of opinion, that there are arteries and veins in the leaves or lungs of plants, and a circulation carried on in them, similar to that, which takes place in the gills and livers of fishes. He says "First the absorbent vessels of the roots and surfaces unite at the footstalk of the leaf; and then, like the *Vena Portarum*, an artery commences without the intervention of a heart, and spreads the sap in its numerous ramifications on the upper surface of the leaf, here it changes its colour and properties, and becomes vegetable blood; and is again collected by a pulmonary vein on the under surface of the leaf. This vein, like that which receives the blood from the gills of fish, assumes the office and name of an artery, and branching again disperses

the blood upward to the bud from the footstalk of the leaf, and downward to the roots, where it is all expended in the various secretions, the nourishment, and growth of the plant, as fast as it is prepared." *BOT. GARDEN*.

It must be confessed, however, that our present knowledge of the structure and distribution of the vessels of plants, and of the manner, in which their juices is conveyed, is very limited; and, from the extreme minuteness of the vessels, it is scarcely probable, that we shall ever be able to comprehend this subject perfectly.

Vigils. See Watchings.

Villous, *villosus*. 72. 236.

Violet, *violaceus*. 1333. p. 87.

Viscid, *viscidus*. 235. p. 85.

Viscosity, *viscositas*. 376. 1211.

Vitellus, p. 156.

Viviparous, *viviparus*. 1194.

Volute, *volutus*. p. 169.

Voluble. See Twining.

Volva. 623. See Curtain, and Wrapper.

Volvate, *volvatus*, furnished with a wrapper.

WAR.

Wart, *verruca*. p. 145.

Warty, *verrucosus*. p. 86.

Watchings, *vigiliae*. 1283.

Watery, *aquosus*. 1319. p. 85.

Wedge-shaped. See Cuneiform.

Wheel-shaped. See Rotate.

White, *albus*. 1330. p. 139.

Whitish, *albidus*.

Windowed, *fenestratus*. p. 168.

- Wing, *ala*. 665. 1101. 1203. p. 144.
 Winged, *alatus*. 291. p. 117.
 Winter, *bruma*. 1279.
 Woody, *ligneus* s. *lignosus*. 947. Opposed to herba-
 ceous.
 Woody, *sylvaticus*. 1247.
 Wool, *lana*. 357. p. 146.
 Woolly, *lanatus*. 239. p. 142.
 Wrapper, *volva*. p. 83.
 Wrinkled, *rugosus*. 228. p. 117. 138.

Writhed, *contortuplicatus*, twist-
 ed very much. p. 170.

YEL.

Yellow, *luteus* s. *flavus*. 1336.
 Yellowish, or becoming yellow,
flavescens s. *lutescens*. p. 85.

ZIG.

Zigzag. See Flexuose.

Zone, *zona*.

Zonal, *zonalis*.

Zoned, *zonatus*. p. 87.

A DICTIONARY

of

BOTANICAL TERMS,

WITH THE LATIN BEFORE THE ENGLISH.

ABB.

Abbreviatus, *abbreviated*. 553.
Abortiens s. *abortivus*, *abortive*.
Abrupte, *abruptly*. See **Pinna-**
tus.
Acalyptratus, *acalyptrate*.
Acaulis, *stemless* or *stalkless*.
Accumbens, *accumbent*. p. 167.
Acerosus, *acerose*. 170.
Acicularis, *acicular*.
Acidus, *acid*. 1321.
Acinaciformis, *acinaciform*.
Acinus, *granule* or *granulation*.
Acotyledonis s. *acotyledoneus*,
acotyledonous. 1215. p. 162.
Acris, *acid*. 1326.
Aculeatus, *prickly*. 74. 244. p.
125.
Aculeus, *prickle*. 378. p. 90.
145.
Acuminatus, *acuminate*. 210.
Acutangulus, *acute-angled*. 53.
Acutus, *acute*. 209.
Adductor, *adductor*. p. 69.
Adnatus, *adnate*. 151. 304. p.
127.
Adpressus. See **Appressus**.
Adversus, *adverse*. 142.

AEQ.

Aequalis, *equal*. 571.
Aequinoctialis, *equinoctial*. 1296.
Aestivatio, *estivation*. 1168.
Aggregatae. See Vol. II. p. 343.
Aggregatus, *aggregate*. 459.
1122. p. 100.
Ala, *wing*. 665. 1101. 1203.
p. 144.
Alatus, *winged*. 291. p. 117.
Albumen. p. 151.
Albuminosus, *albuminous*.
Alburnum, *alburnum*.
Albus, *white*. 1330.
Algæ. p. 63. and Vol. II.
p. 351.
Alpinus, *alpine*. 1237.
Alternatim, *alternately*.
Alternus, *alternate*, 95. 115.
Alveolatus, *alveolate*, or *honey-*
combed. 1120. p. 124.
Amarus, *bitter*. 1322.
Ambrosiacus, *ambrosial*. 1308.
Amentaceæ. See Vol. II. p. 339.
Amentaceus, *amentaceous*.
Amentum, *ament*. 462.
Amplectens s. *amplexans*, *em-*
bracing.

Amplexicaulis, *stem-clasping*.
 Ampliatus, *enlarged*.
 Amygdalino-carnosus, *almond-fleshy*. p. 154.
 Anastomosans, *anastomosing*. p. 88.
 Anceps, *two-edged*.
 Androgynus, *androgynous*. 1200. and p. 66.
 Anfractuosus, *chinky*. p. 168.
 Angiospermia. See p. 60.
 Angiospermus, *angiospermous*.
 Angiothecium. See Vol. II. p. 288.
 Angularis s. angulatus, *angled or angular*. 53. p. 135.
 Angulus, *angle*.
 Angustatus, *narrowed*. 654.
 Angustifolius, *narrow-leaved*.
 Angustus, *narrow*. p. 123.
 Annulatus, *annulate, or ringed*, furnished with a ring. p. 84.
 Annulus, *ring*. p. 73. and 85.
 Annuus, *annual* 1.
 Anomalus, *anomalous*. p. 112.
 Anthera, *anther*. 750.
 Antheriformis, *anther-form*.
 Anthesis, *anthesis*.
 Anthracinus, *coal-black*. p. 138.
 Apertio, *opening*. 1287.
 Apetalus, *apetalous*.
 Apex, *top or summit*.
 Aphroditus, *aphrodite, or unisexual*.
 Aphyllus, *leafless*.
 Apiculatus, *apiculate*. p. 125. 138.
 Apophysis, *process, or excrescence*. p. 70.
 Appendicula, *appendage*.
 Appendiculatus, *appendaged*. 307. p. 131.
 Appressus, *appressed*. 132.
 Approximatus, *approximate*. 624.
 Aquosus, *watery*. 1319. p. 85.

Arachnoideus. *arachnoid*. p. 107.
 Araneosus, *cobweb-like*.
 Arbor, *tree*.
 Arborescens, *arborescent*.
 Arboretum. See 368.
 Arboreus, *arborescent*. 26.
 Arctus, *strait*.
 Arcuatus, *bowed*. 740. 1007. p. 168. 173.
 Arena, *sand*. 1257.
 Argilla, *clay*, 1255.
 Aridus, *dry, or parched*. 1341.
 Arillatus, *arilled*. 1051.
 Arillus, *aril*. 1100. p. 150.
 Arista, *awn*, 606. p. 145.
 Aristatus, *awned*, 603. p. 141.
 Arma, *arms*. 377.*
 Aromaticus, *aromatic*. 1314.
 Articulate, *jointedly*.
 Articulatus, *jointed*. 9. 83. 277. 944. 958. p. 120.
 Articulus, *joint*.
 Artificialis, *artificial*. 1363.
 Arvensis, *fallow*. 1253.
 Ascendens, *ascending*. 355. 1005.
 Asexualis, *asexual, destitute of sex, and bearing buds only*. See Gærtner.
 Asper, *rough*. 69. 242.
 Asperifoliae. See Vol. II. p. 336.
 Asperifolius, *rough-leaved*.
 Assurgens, *assurgent*. 135.
 Attenuatus, *attenuated*. 442.
 Auctus, *increased, or double*.
 Aurantiacus s. aurantius, *orange*. 1337.
 Auriculatus s. auritus, *appendaged or eared*.
 Auriformis, *ear-shaped*.
 Autumnatio, *autumnation*. 1265.
 Avenis s. avenius, *veinless*.
 Axilla, *axil*.

AXI.

Axillaris, *axillary*. 113.
 Axipendulus, *axipendulous*. p.
 133.

BAC.

Bacca, *berry*. 1029. p. 117.
 118.
 Baccatio, *baccation*. 1209.
 Baccatus, *berried*. 1084. p. 112.
 115. 120. 136.
 Baccifer, *berry-bearing*.
 Badius, *bay*. p. 87.
 Barba, *beard*. 358.
 Barbatus, *bearded*. 240.
 Basilaris, *basilar*. p. 64.
 Basis, *base*. p. 132.
 Bicapsularis, *two-capsuled*.
 Bicolor, *two-coloured*.
 Bicornis, *two-horned*.
 Bicornes. See Vol. II. p. 321.
 Biennis, *biennial*. 2.
 Bidentatus, *two-toothed*.
 Bifariam, *bifariously*.
 Bifarius, *bifarious*. 117.
 Biferus, *bearing twice a year*.
 Bifidus, *bifid*, or *two-cleft*. 183.
 Biflorus, *two-flowered*.
 Bigeminus, *bigeminate*. 284.
 Bijugus, *bijugous*. 283.
 Bilabiatus, *two-lipped*.
 Bilamellatus, *bilamellated*.
 Bilobatus s. Bilobus, *two-lobed*.
 184. p. 99.
 Bilocularis, *two-celled*. 951.
 Binarius, *binary*. p. 115.
 Binatus, *binate*. 280.
 Binus, *two together*.
 Bipartibilis, *two-partible*. p. 98.
 Bipartitus, *two-parted*. 186.
 Bipinnatifidus, *bipinnatifid*.
 Bipinnatus, *bipinnate*. 286.
 Bitermatus, *biterminal*. 285.
 Bivalvis, *two-valved*. 598. 619.
 Brachiatus, *brachiate*. 86.
 Bractea, *bracte*. 393.*

BRA.

271

Bracteatus, *bracteate*. 448. p.
 134.
 Brevis, *short*. 299.
 Brevissimus, *very short*. 298.
 344. 682. 730. 811. 855.
 Bruma, *winter*. 1279.
 Bulbifer s. Bulbiger, *bulbiferous*.
 79. 1142.
 Bulbosus, *bulbous*. 15.
 Bulbus, *bulb*. 1146.
 Bullatus, *bullate*. 229. p. 135.

CAD.

Caducus, *caducous*. 273. 550.
 579. 685. p. 140.
 Cæruleus, *blue*. 1334.
 Cæsius, *blue grey*. p. 139.
 Cæspitosus, *cespitose*. 1245.
 Calamarix. See Vol. II. p.
 399.
 Calcar, *spur*.
 Calcaratus, *spurred*. 701.
 Calendarium, *calendar*. 1269.
 Calycanthemæ. See Vol. II.
 p. 320.
 Calycifloræ. See Vol. II. p.
 320.
 Calycinus, *calycine*, or *calyx*.
 375. 387. 722.
 Calyculatus, *calycked*. 587. p.
 140.
 Calyculus, *calycle*. 1099.
 Calyptra, *calyptræ*, 620. and
 p. 68.
 Calyx. 543.
 Campanacæ. See Vol. II. p. 326.
 Campanulatus, *campanulate*,
 642.
 Campestris, *pasture*. 1249.
 Canaliculatus, *channelled*. 247.
 Cancellatus, *cancellate*, or *latti-*
ced. p. 137.
 Capillaceus s. Capillaris, *capil-*
lary. 708. 1095. p. 141.
 Capillus, *hair*.

Capitatus, *capitate* or *headed*. 881.
Capituliformis, *capituliform*, p. 67.
Capitulum, *a little head*. 469.
Capreolus. See **Cirrhus**.
Capsula, *capsule*. 919. and p. 70. 111.
Capsularis, *capsular* or *capsuled*.
Carina, *keel*. 663.
Carinatus, *keeled*. 260. p. 169.
Carneus, *flesh-coloured*. p. 87.
Carnosus, *fleshy*. 264. 946. 996. p. 148. 154.
Cartilagineus, *cartilaginous*. 199. p. 154.
Caryophyllei. See Vol. II, p. 322.
Caseosus, *cheese-like*. p. 151.
Castaneus, *chestnut-colour*. p. 87.
Castratus, *castrated*. 718.
Cauda, *tail*. 1097. 1202. p. 143.
Caudatus, *tailed*. 1061.
Caudex, *trunk* or *stock*.
Caulescens, *caulescent*.
Caulinus, *cauline* or *stem*. 111. 1150.
Caulis, *stem*. 19.
Cavus, *hollow*. p. 118.
Centralis, *central*. p. 84. 109. 128. 152. 174.
Cerealina. See 1368.
Centrifugus, *centrifugal*, p. 133.
Centripetus, *centripetal*. p. 133.
Cernuus, *cernuous*, 424. p. 72.
Cervinus, *fawn-colour*. p. 87.
Cespitosus. See **Cæspitosus**.
Chalaza, p. 149.
Character. See **Naturalis**, **Essentialis**, **Factitius**.
Chartaceus, *paper-like*. p. 147. 150.
Cicatrizatus, *cicatrized*.
Cicatricula, *a scar*. p. 130.
Cilia, *parallel hairs, like eyelashes*.

Ciliatus, *ciliate*. 196. p. 74.
Cinereus, *some what ash-coloured*. p. 87.
Cinereus, *ash-coloured*. p. 87.
Cingens, *surrounding*.
Circinalis, *circinal*. 1167.
Circumscissus, *cut round*. 943.
Circumsepiens, *fortifying* or *fencing round*. 1291.
Cirrhifer, *tendrill-bearing*.
Cirrhosus, *tendrilled*. 213.
Cirrhus, *tendrill*. 346.*
Classis, *class*.
Clausus, *closed*. 632.
Clavæformis s. **Clavatus**, *club-shaped* or *clubbed*. 292. p. 67.
Clavicula. See **Cirrhus**.
Clima, *climate*. 1229.
Coacervatus, *heaped together*. p. 175.
Coadunatæ. See Vol. II, p. 348.
Coadunatus, *coadunate*. 152. p. 96.
Coalitus, *coalesced*.
Coarctatus, *compact* or *close*. 535.
Coccineus, *scarlet*. p. 87.
Coccum, *a cell containing one seed*. p. 114.
Cochleariformis, *spoon-shaped*. p. 169.
Cochleatus, *cochleate*, or *spiral*. p. 168.
Cohærens, *cohering*. 793.
Collare, *collar*. p. 84.
Collateralis, *collateral*. p. 167.
Collum, *neck*.
Color, *colour*. 1329.
Coloratus, *coloured*. 218.
Columella, *column*. 954.
Columnaris, *columnar*. 257. 294. 926.
Columniferæ. See Vol. II, p. 332.
Columnula, *column*. p. 73.

COM.

CON.

273

Coma, *tuft*. 398. p. 143.
 Combinatio, *combination*. p. 98.
 Communis, *common*. 400. 582.
 1074. 1106. 1157. p. 126.
 Comosus, *comose*. 519.
 Compactus, *compact*. 102. 261.
 Completus, *complete*. See p.
 104. 109. 150. 171.
 Complicatus, *folded together*.
 Compositæ. See Vol. II. p.
 343.
 Compositus, *compound*. 455.
 460. 505. 521. 542. 689.
 1121. p. 75. 99. 122. 142.
 175.
 Compressus, *compressed*. 51.
 259. p. 166.
 Concavus, *concave*. 248. 130.
 Conceptaculum, *conceptacle*.
 Concolor, *of the same colour*.
 Conduplicans, *conduplicating*.
 1293.
 Conduplicatus, *conduplicate*.
 1159. p. 173.
 Confertus, *crowded*. 98. 119.
 497. 534.
 Confluens, *confluent*. 123. p.
 90.
 Conformis, *conform*. 1175.
 Congelatio, *congelation*. 1278.
 Congestus, *heaped together*.
 Conglobatus, *conglobate*. p. 169.
 Conglomeratus, *conglomerate*.
 Conicus, *conical*. 830. 1118. p.
 176.
 Coniferæ. See Vol. II. p. 347.
 Conjugatus, *conjugate*. 278. p.
 174.
 Conjunctus, *united*. p. 89.
 Connatus, *connate*. 156. 728.
 790.
 Connivens, *converging*. 741.
 1289. p. 169.
 Consociatus, *consociated*. p.
 100.
 Contiguus, *contiguous*. p. 166.

Contortio, See Torsio.
 Contortuplicatus, *writhed*. p.
 170.
 Contortus, *contorted*.
 Contortæ. See Vol. II. p.
 326.
 Contractus, *contracted*. 537.
 Contrarius, *contrary*. p. 110.
 p. 131.
 Conus, *cone*. See Strobile.
 Convexus, *convex*. 249. p. 130.
 Convolutus, *convolute*. 354.
 1160. p. 169.
 Corculum, *corcle*. 1088.
 Cordatus, *cordate*. 176.
 Coriaceus, *coriaceous*. 945. p.
 136. 147. 154.
 Corniculatus, s. Cornutus, *horn-*
shaped.
 Corolla, *corol*. 626.
 Corollifer, *corol-bearing*.
 Corollinus, *corolline*. 721.
 Corona, *crown*. 1092.
 Coronatus, *crowned*. 942.
 Coroniformis, *crown-shaped*.
 893.
 Coronariæ. See Vol. II. p.
 316.
 Coronula, *coronet or coronule*.
 Coronulatus, *coronnetted, or coro-*
nulate.
 Cortex, *bark*.
 Cortex, *rind*. p. 103. 115.
 Corticalis, *cortical*. 1154.
 Corticatus, *corticated*. p. 112.
 113. 119. 120.
 Corydales. See Vol. II. p.
 324.
 Corymbosus, *corymbous*.
 Corymbus, *corymb*. 464.
 Costa, *rib*. 145.
 Costatus, *ribbed*. p. 137.
 Cotyledo, *cotyledon*. 1091. p.
 160.
 Crassiusculus, *thickish*.
 Crassus, *thick*. 858.

Crenatus, *crenate*. 194.
Crenulatus, *crenulate*.
Creta, *chalk*. 1256.
Crinitus, *crinite*. p. 117.
Crispus s. **Crispatus**, *curled*.
 253. p. 117.
Crista, *crest*. p. 144.
Cristatus, *crested*. 1193. p.
 117.
Croceus, *saffron-coloured*. p. 87.
Cruciatim, *crosswise*.
Cruciatum s. **Cruciformis**, *crossed*
or cross-shaped. 659.
Crustaceus, *crustaceous*. p. 136.
 148.
Cryptogamia. See p. 59.
Cubitalis, *a cubit in length*.
 1357.
Cubitus, *cubit*. 1357.
Cucullatus, *cowled, or cucullate*.
 250.
Cucurbitaceæ. See Vol. II. p.
 330.
Culinaris, *culinary*. 1364.
Culmus, *culm*. 20.
Cultus, *cultivated*. 1251.
Cunctans, *retarded*. 1268.
Cuneatus s. **Cuneiformis**, *wedge-*
shaped. 164.
Curvatio, *curvature*. 1208.
Curvembryus, *curvembryous*.
Curvus, *curved*. p. 135. 173.
Cuspidatus, *cuspidate*. 211.
Cuspis, *spit-point*.
Cyathiformis, *glass-shaped*. 646.
Cyclical, *cyclicus*. p. 173.
Cylindricus, *cylindrical*. 49.
 510.
Cyma, *cyme*. 452. 1137.
Cymbiformis, *boat-shaped*.
Cysta, according to Scopoli, is a
 species of pericarp, consist-
 ing of a three-fold involucre,
 which does not open, one
 membranous, another succu-
 lent or fleshy, and the third

or innermost membranous or
 brittle, as in *Berberis*.

DÆ.

Dædaleus, *dedaleous*. 203.
Debilis, *feeble*.
Decagynia. See p. 60.
Decagynus, *decagynous*, *ten-*
pistilled, or having ten pittils.
Decandria. See p. 158 and 61.
Decandrus, *decandrous, or ten-*
stamened.
Decaphyllus, *ten-leaved*.
Decapetalus, *ten-petalled*.
Decemfidus, *ten-cleft*.
Decemlocularis, *ten-celled*.
Deciduus, *deciduous*. 272. 549.
 580. 686. 875.
Declinans, *declining*.
Declinatus, *declined*. 36.
Decompositus, *decompound or*
doubly compound.
Decumbens, *decumbent*.
Decurrens, *decurrent*. 153.
 305. p. 88.
Decursive, *decursively*.
Decussatim, *decussatedly*.
Decussatus, *decussated*. 127.
Deflexus, *deflected*. 105.
Defloratus, *deflorate*. 820.
Defoliatio, *defoliation*. 1277.
Dehiscens, *opening*. 822.
Dehiscencia, *the opening of a*
capsule.
Deltoides s. **Deltoideus**, *deltoid*.
 173.
Demersus, *demersed*.
Dendroides, *shrub-like*.
Dens, *tooth*.
Densus, *dense*. 535.
Dentato-serratus, *dentato-serrated*.
Dentato-sinuatus, *dentato-sinua-*
ted.
Dentatus, *toothed*. 10. 716. p.
 74. 167.
Denticulatus, *denticulate*.

DEN.

Denticulus, *toothlet*.
 Denus, *ten together*. p. 97.
 Dependens, *dependent*. 140.
 Depressus, *depressed*. 258.
 Dermatocarpum. See Vol. II, p. 291.
 Devius, *devious*. p. 131.
 Dextrorsum, *from right to left*.
 Diadelphia. See p. 58.
 Diandria. See p. 58 and 62.
 Diandrus, *two-stamened* or *dian-drous*.
 Diaphanus, *diaphanous*. 982.
 Dichotomus, *dichotomous*. 85.
 Diclinia (from *dis* twice, and *κλινη* bed) *two beds*. p. 57.
 Diclinus, *having two beds*. See Vol. II. p. 350.
 Dicoecus, *two-grained*. 952.
 Dicotyledonis s. Dicotyledoneus, *dicotyledonous*, 1221. p. 164.
 Didymus, *didymous*. 818. 838.
 Didynamia. See p. 58.
 Didynamus s. Didynamicus, *didynamous*.
 Difformis, *difform*. 640. 1176. p. 88. 135. 140.
 Diffusus, *diffuse*. 39. 539.
 Digitatus, *digitate*. 279. p. 117. 175.
 Digynia. See p. 60.
 Digynus, *digynous*, or *two-pistilled*.
 Dimidiatus, *halved*, 501. 618. p. 86.
 Dimorphus, *dimorphous*. p. 67.
 Dioecia. p. 59 and 62.
 Dioicus, *dioicous*.
 Dipetalus, *two-petalled*. 627.
 Diphyllus, *two-leaved*.
 Dipterygius, *two-winged*. p. 144.
 Disciformis s. Discoideus, *disk-like*. p. 67. 134.
 Discus, *disk*.
 Dispermus, *two-seeded*.

DIS.

275

Dissectus, *incised, gashed* or *dissected*.
 Dissepimentum, *dissepiment*. 953. p. 109.
 Dissiliens elastice, *bursting elastically*.
 Dissimilis, *dissimilar*. p. 142.
 Distachyus, *two-spiked*.
 Distans, *distant*.
 Distichus, *two-rowed*. 96. 116. 507.
 Distinctus, *distinct*. 789.
 Divaricatus, *divaricate*. 94. 104. 540.
 Divergens, *diverging*. 103. 540. p. 167.
 Divisus, *divided*. p. 155.
 Dodecagynia. See p. 60.
 Dodecagynus, *twelve-pistilled*.
 Dodecandria. See p. 58 and 61.
 Dodecandrus, *twelve-stamened*.
 Dodrans, *a long span*. 1353.
 Dodrantalis, *of a long span*. 1353.
 Dolabriformis, *dolabriform*. 271.
 Dorsalis, *dorsal*. 608.
 Dorsifer, *dorsiferous*.
 Dorsipendulus, *dorsipendulous*. p. 133.
 Dorsum, *back*. p. 105. 132.
 Drupa, *drupe*. 1020. p. 115.
 Drupaceus, *drupaceous*. p. 120. 122.
 Dulcis, *sweet*. 1325.
 Dumosæ. See Vol. II. p. 338.
 Duplicatus, *doubled*.
 Duplex, *double*, p. 75.
 Duplicato-crenatus, *doubly crenate*.
 Duplicato-pinnatus, *doubly pinnate*.
 Duplicato-serratus, *doubly serrated*.
 Duplicato-ternatus, *doubly ternate*.
 Duratio, *duration*. 1299.

urus, *hard*. p. 103.

EBR.

Ebracteatus, *bracteless*.

Ecalcaratus, *spurless*.

Ecaudatus, *tail-less*.

Eccentricus, *eccentric*. p. 84.
174.

Echinatus, *echinate*. p. 75.

Edentatus, *toothless*.

Effiguratus, *figured*. p. 74.

Efflorescentia. See *Florescentia*.

Eglandulosus, *glandless*.

Elastice, *elastically*.

Elasticitas, *elasticity*. 1212.

Elasticus, *elastic*. 936.

Ellipticus, *elliptical*. 168.

Emarginatus, *emarginate*. 205.

Embryo. p. 171.

Endecandria. See p. 61.

Enervis, *nerveless*.

Enneandria. See pages 58 and 61.

Enodis, *knotless* or *jointless*. 85.

Ensatae. See Vol. II. p. 312.

Ensiformis, *enisform*. 268.

Ephemerus, *ephemeral*. 1303.

Epigæus, *epigean*. p. 164.

Epidermis, *cuticle*. p. 149. 161.

Epiphyllouspermus, *epiphyllouspermous*.

Equitans, *equitant*. 1164.

Erectus, *erect*. 30. 101. 129. p. 127. 133.

Erosus, *eroded*. 202.

Essentialis, *essential*.

Evalvis, *valveless*.

Evanescens, *fugacious*, or *vanishing*. p. 85.

Evolvatus, *evolvate*.

Exalbuminosus, *exalbuminous*.

Exaratus, *furrowed*. p. 117.

Exasperatus, *roughened*.

Excavatus, *excavated*, or *hollowed*.

Excentricus. See *Eccentricus*.

Exfoliatio, *exfoliation*. 1276.

Exilis, *minute*. p. 137.

Exsertus, *protruded*, or *projecting*.

Expansus, *expanded*.

Exsolatio, *transplantation*. 1276.

Extipulatus, *stipule-less*, or *extipulate*.

Exsuccus, *juiceless*. p. 115.

Exsulcus, *furrowless*.

Externus, *external*. p. 130.
152.

Extrafoliaceus, *extrafoliaceus*.
321.

FAC.

Factitius, *factitious*.

Falcatus, *falcate*, or *sickle-shaped*.
999. p. 168. 173.

Familia, *family*.

Farctus, *stuffed*. p. 83.

Farina, *meal*.

Farinaceus s. Farinosus, *mealy*.
p. 153.

Fasciatus, *fasciate*. 1183.

Fascicularis, *fascicular*. 13.

Fasciculatus, *fasciculate*, or *fascicled*. 121.

Fasciculus, *fascicle*. 468. 1183.

Fastigiatus, *fastigate*. 92. p. 73.

Faux, *throat*. 651.

Favosus, *honey-combed*. p. 124.

Femina, *female*. 1198.

Femineus s. Femininus, *female*.

Fenestratus, *windowed*. p. 168.

Ferrugineus, *rust-colour*. p. 138.

Fertilis, *fertile*.

Fibrosus, *fibrous*. 4. p. 115.

Figuratus. See *Effiguratus*.

Filamentosus, *filamentous*.

Filamentum, *filament*. 707.

Filices, *Ferns*. See p. 63.

Filices. See Vol. II. p. 348.

Filiformis, *filiform*. 441.

Filum, *thread*.
 Fimbriatus, *fimbriate*, or *fringed*.
 Fissilis, *splitting*. p. 84.
 Fissus, *cloven*. 183.
 Fistulosus, *fistulous*. 29.
 Flabellatus s. Flabelliformis. *fan-shaped*. p. 86.
 Flaccidus, *flaccid*. 428.
 Flavescens, *yellowish*. p. 85.
 Flavus, *yellow*.
 Flagellum, *runner*.
 Flexilis, *flexible*.
 Flexuosus, *flexuose*. p. 169.
 Flexus, *bent*. 909.
 Floccosus, *flocculent*. p. 86.
 Floralis, *floral*. 114. 1156.
 Florens, *flourishing*; *flowering*, or *retaining its verdure*.
 Florescentia, *florescence*, 1272.
 Florifer, *floriferous*. p. 65.
 Flos, *flower*.
 Flosculosus, *floscular*, or *flosculous*.
 Flosculus, *floret*.
 Fluxilis, *caducous*. p. 140.
 Fœcundus, *fertile*. 821.
 Foliaceus, *foliaceous*, or *leaf-like*. 371. 518. p. 166. 172.
 Foliaris, *foliar*. 348. 1155.
 Foliatio, *foliation*. See *Vernatio*.
 Foliatus, *leaved*.
 Foliosus, *leafy*.
 Folium, *leaf*. See p. 6th.
 Folliculus, *follicle*. 1019. and p. 69. 111.
 Fornicatus, *arched*. 653.
 Fovilla, *fovilla*.
 Fornix, *arch*.
 Fragilis, *brittle*.
 Fragrans, *fragrant*. 1310.
 Friabilis, *friable*. p. 154.
 Frondescentia, *frondescence*. 1260. 1271.
 Frondosi, *frondose*. p. 64.
 Frondosus, *frondose*. 1192.

Frons, *frond*.
 Fructescentia, *fructescence*.
 Fructificatio, *fructification*. p. 24.
 Fructus, *fruit*. p. 92.
 Frutescens, *frutescent*.
 Frutetum. See 1368.
 Frutex, *shrub*.
 Fruticosus, *shrub-like*, or *shrubby*. 25.
 Fugacissimus, *very fugacious*.
 Fugax, *fugacious*. p. 85.
 Fulcratus, *fulcrate*, or *fulcred*.
 Fulcrum, *fulcre*, or *prop*. p. 15.
 Fuliginosus, *sooty*. p. 87.
 Fulvus, *tawny*. p. 87.
 Fungosus, *fungous*. 1079. p. 135.
 Fungi. See p. 63; and Vol. II. p. 352.
 Fungiformis, *fungiform*. p. 172.
 Furca, *fork*, 382.
 Furcatus, *forked*. 774.
 Furfuraceus, *branny*. p. 84.
 Fusiformis, *fusiform*. 6.
 Fuscescens, *brownish*, p. 87.
 Fuscus, *brown*. p. 87.

GAL.

Galea, *helmet*. 649.
 Galeatus, *helmetted*.
 Gelatinosus, *gelatinous*.
 Geminatus s. Geminus, *in pairs*. p. 97. 143.
 Gemma, *bud*. 1151.
 Gemmaceus s. Gemmiformis, *gemmaceous*, or *budlike*. p. 67.
 Gemmatio, *gemination*, or *budding*. 1145.
 Gemmificatio, *gemmification*.
 Gemmiparus, *gemmiparous*.
 Genericus, *generic*.
 Geniculatus, *geniculate*.
 Geniculum, *knee-joint*, *joint*, or *knot*.

- Genitalia, *genitals*.
 Gentes, *nations*.
 Genus. See p. 214.
 Germen. 825.
 Germinatio, *germination*. 1259.
 1270.
 Gibbus, *gibbous*. 256.
 Gigartoides, *gigartoid*. p. 135.
 Glaber, *smooth*. 68. 215. p. 137.
 Glacies, *ice*. 1280.
 Glandula, *gland*. 370.
 Glandulatio, *glandulation*.
 Glandulifer, *glanduliferous*, or
gland-bearing.
 Glandulosus, *glandular*.
 Glareosus, *gravelly*.
 Glaucus, *glaucous*. p. 87.
 Globosus, *globular*. 11. 500.
 560. 641. 882. p. 134.
 Glochis, *barbed point*. 368, p.
 145.
 Glomeratus, *glomerate*. 506.
 Glomerulus, *glomerule*.
 Gluma, *glume*. 594.
 Glumosus, *glumose*.
 Gluten, *gluten* or *glue*. 1207.
 Glutinositas, *glutinosity*. 377.
 Glutinosus, *glutinous*.
 Gnomonicus, *gnomonic*. p. 173.
 Gnomonicus, *gnomonic*. p. 173.
 Gongylus. See Bud.
 Gossypinus, *cottony*.
 Gramina. See Vol. II. p. 310.
 Gramineus, *gramineous*, or
grassy.
 Grandiflorus, *large flowered*.
 1188.
 Granatum, according to Scopoli,
 is a species of pericarp, formed
 of a double involucre, which
 does not open, one cork-like,
 or coriaceous, the other suc-
 culent; as in *Punica*.
 Granifer, *graniferous*, or *grain-*
bearing.
 Granulatus, *granulated*. 16.

- Granulum, *grain*, or *granule*.
 Griseus, *grey*. p. 87.
 Grossificatio, *grossification*.
 1273.
 Gruinales. See Vol. II. p. 319.
 Grumosus, *grumose*. p. 155.
 Gymnospermia. See p. 60.
 Gymnospermus, *gymnospermous*,
 having naked seeds.
 Gymnothecium. See Vol. II.
 p. 291.
 Gynandria. See pages 58 and
 62.
 Gynandrus, *gynandrous*.
 HAB.
 Habitatio, *habitation*.
 Habitus, *habit*. p. 45.
 Hamosus, *hooked*.
 Hamus s. Hamulus, *hook*. 367.
 1098. 1206.
 Hastatus, *hastate*. 188.
 Hederaceæ. See Vol. II. p. 341.
 Helvolus, *pale red*. p. 138.
 Hemisphæricus, *hemispherical*.
 p. 86.
 Hepaticæ. See Vol. II. p. 260.
 Hepaticus, *liver-coloured*. p. 87.
 Hepatici, *hepatic*. See p. 64.
 Heptagynia. See p. 60.
 Heptandria. See p. 58.
 Heptandrus, *heptandrous*.
 Herba, *herb*.
 Herbaceus, *herbaceous*. 23. p.
 154.
 Herbarium, a collection of dried
 or preserved plants.
 Hermaphroditus, *hermaphrodite*.
 1199.
 Hesperideæ. See Vol. II. p.
 322.
 Heteromallus, *one-rowed*. p. 66.
 Heterophyllus, *heterophyllous*.
 p. 163.
 Hexagonus, *six-cornered*.
 Hexagynia. See p. 60.

Hexagynus, *hexagynous*, or *six-pistilled*.

Hexandria. See p. 58 and 61.

Hexandrus, *hexandrous*.

Hexapetalus, *six-petalled*.

Hexaphyllus, *six-leaved*.

Hians, *gaping*.

Hilum, *eye*, or *navel-scar*. 1087.

Hircinus s. Hircosus, *goatish*.
1309. p. 87.

Hirsutus, *hirsute*.

Hirtus, *rough-haired*.

Hispidus, *hispid*. 73. 243.

Holeraceæ. See Vol. II. p.
318.

Homophyllus, *homophyllous*. p.
163.

Horizontalis, *horizontal*. 18.
134. p. 89. 110. 133.

Horologium, *horologe*.

Humidus, *moist*. 1340.

Humus, *mould*. 1254.

Hyalinus, *watery blue*, the
colour of water.

Hybernaculum, *hybernacle*.

Hybridus, *hybrid*.

Hymenothecium. See Vol. II.
p. 292.

Hypocrateriformis, *hypocrateri-
form*. 644.

Hypogæus, *hypogean*. p. 165.

ICO.

Icosandria. See pages 58 and
61.

Icosandrus, *icosandrous*.

Imberbis, *beardless*.

Imbricans, *imbricating*. 1298.

Imbricatus, *imbricated*. 61. 120.
583. 1163.

Immersus, *immersed*.

Impari-pinnatum, *impari-pin-
nate*, pinnate with an odd leaf-
let.

Imperfectus, *imperfect*. p. 171.

Implexus s. Implicatus. *impli-
cated*.

Inæqualis, *unequal*. 572. 639-
p. 88.

Inanis, *pithy*. 58.

Inarticulatus, *not jointed*.

Incanus, *hoary*.

Incarnatus, *flesh-coloured*. p. 87.

Incisura, *incision*.

Incisus, *incised*.

Inclinans, *inclining*.

Inclinatus, *inclined*. p. 71.

Includens, *inclosing*. 1290.

Inclusus, *included*, or *inclosed*.
813.

Incompletus, *incomplete*. p. 104.
109. 171.

Inconspicuus, *inconspicuous*. p.
123.

Incrassatus, *incrassated*. 444.

Incumbens, *incumbent*. 794. p.
167.

Incurvatus s. Incurvus, *incur-
ved*. 37. 380. p. 71.

Indivisus, *undivided*.

Indusium, *indusium*. See p. 217.

Inermis, *unarmed*.

Inferus, *inferior*. 578. 847, p.
101. 124.

Inflatio, *inflation*. 1210.

Inflatus, *inflated*. 559.

Inflexus, *inflected*. 136.

Inflorescentia, *inflorescence*. See
p. 20.

Infundibuliformis, *infundibuli-
form*, or *funnel-shaped*. 643.

Innocuus, *innocent*. p. 154.

Insertio, *insertion*.

Insertus, *inserted*. 303.

Instrumentalis, *instrumental*.
1368.

Integer, *entire*. 171.

Integerrimus, *very entire*. 193.
p. 148.

Integumentum, *integument*. p.
147.

Interfoliaceus, *interfoliaceous*.

Interfoliaris, *interfoliar*. p. 64.

- Internodium, internode.**
Internus, internal. p. 131. 152.
Interrupte-pinnatus, interruptedly pinnate.
Interruptus, interrupted.
Intervalvis, intervalved. p. 110.
Intorsio, twisting.
Intrafoliaceus, intrafoliaceous. 322.
Inundatae. See Vol. II. p. 320.
Inundatus, inundated. 1243.
Invertens, inverting. 1297.
Inversus, inverted. p. 133.
Involucellum, involucret, or involucel. 590.
Involucratus, involucred. 495. p. 95. 113.
Involucrum, involucre. 588.
Involutus, involute. 1161.
Involvens, involving. 1294.
Irregularis, irregular. 638. p. 88. 107.
Isthmus, isthmus. 1018.

JUB.

- Juba, a crest of feathers.**
Jugum, a pair, or a ridge. p. 145.
Juliformis, juliform, or catkin-like.
Julus, a catkin or ament.

LAB.

- Labiatus, lipped.** 573.
Labium, a lip. 650.
Labyrinthiformis, labyrinthform. p. 89.
Lacer, ragged. 201.
Lacinia, segment.
Laciniatus, lacinated. 191. 636.
Lactescens, lactescent, or milky. p. 85.
Lactescentia, lactescence.
Lactifluus. See Lactescens.

- Lacunosus, lacunose, or pitted.** 230. p. 169.
Lacustris, lacustrian. 1238.
Laevigatus, polished. p. 115. 137.
Laevis, even. 65.
Lamella, gill. p. 88.
Lamellatus, lamellated.
Lamina, lamina. 633.
Lana, wool. 357. p. 146.
Lanatus, woolly. 239. p. 142.
Lanceolatus, lanceolate. 167.
Lanceolato-ovatus, lanceolato-ovate.
Lanuginosus, downy.
Lanugo, down.
Lapideus, stony. p. 116. 148.
Lateralis, lateral. 320. 795. p. 84. 128.
Lateriflorus, side-flowered. 471.
Laterifolius, side-leaved.
Latifolius, broad-leaved. 1184.
Latitans, concealed.
Latus, broad.
Latus, side. p. 132.
Laxus, loose, lax, or limber.
Legumen, legume. 961. p. 119.
Leguminosus, leguminose. p. 112.
Lenticularis, lenticular. p. 134.
Lentus, slow. 1267.
Leprosus, leprous.
Liber, free. p. 88. 127.
Liber, inner bark.
Ligneus s. Lignosus, woody. 947.
Ligula, a strap. See Vol. II. p. 311.
Ligulatus, ligulate, 690.
Limbus, limbus, or border. 632.
Linea, line. 1350.
Linearis, linear. 169. 1350.
Lineari-lanceolatus, lineari-lanceolate.
Lineari-subulatus, lineari-subulate.

Lineatus, *streaked, or marked with lines.*

Linguiformis s. Lingulatus, *linguiform, lingulate, or tongue-shaped.*

Littoralis, *shorey.* 1239.

Lividus, *livid.* p. 87.

Lobatus, *lobed.* p. 155.

Lobus, *a lobe.*

Loculamentum, *a cell.* 950. p. 106.

Loculatus, *celled.*

Locus, *place.*

Locusta, *locust,*

Lomentaceæ. See Vol. II. p. 329.

Longissimus, *very long.* 302. 681. 729. 810. 854.

Longitudinalis, *longitudinal.* p. 107.

Longus, *long.* 301. 346. 564.

Lucidus, *lucid.* p. 137.

Luridæ. See Vol. II. p. 325.

Luteus, *yellow.* 1336.

Lunatus s. Lunulatus, *crescent-shaped.*

Lyratus, *lyrate.*

Lytothecium. See Vol. II. p. 291.

MAC.

Macellum. See 1368.

Maculatus, *spotted,* p. 87.

Magnus, *large.* p. 137.

Marcescens, *shrivelling.* 688. 917.

Marginalis, *marginal.* p. 110.

Marginatus, *marginate.* p. 138. 140.

Margo, *margin.*

Marinus, *marine.* 1240.

Maritimus, *maritime.* 1235.

Mas, *male.* 1197.

Masculinus s. Masculus, *male.*

Maturatio, *maturation.* 1274.

Mediocris, *middle-sized.*

Mediterraneus, *mediterranean.* 1236.

Medius, *middle.* p. 137.

Medulla, *pith, or marrow.*

Melinus, *honey colour.* p. 138.

Membranaceus, *membranous.* p. 150.

Membranatus, *membranate, or membraned.*

Meniscoideus, *meniscoid.* p. 135.

Menstruus, *menstrual.* 1305.

Mensura, *measure.* p. 85.

Messis, *harvest.* 1275.

Meteoricus, *meteorical.* 1284.

Methodus, *method.* See p. 220.

Minimus, *very small.* 851.

Minutus, *minute.* p. 137.

Miscellanæ. See Vol. II. p. 348.

Mixtus, *mixed.* p. 103.

Mollis, *soft.* p. 103.

Molendinaceus, *molendinaceous.* p. 137.

Monadelphia. See p. 58 and 62.

Monadelphus, *monadelphous.*

Monandria. See p. 58.

Monandrus, *monandrous, or one-stamened.*

Monoclinia (from *μονος* single, and *κλινη* bed) *one bed.* p. 57.

Monoclinus, *having one bed.* See Vol. II. p. 350.

Monocotyledonis s. Monocotyledoneus, *monocotyledonous.* 1217. p. 162.

Menocia. See p. 59 and 62.

Monogamia. See p. 61.

Monogamus, *monogamous.*

Monogynia. See p. 60.

Monogynus, *monogynous.*

Monoicus, *monoicous*, or *monoeci-*
ous.

Monopetalus, *monopetalous*,
or *one-petalled*. 627.

Monophyllus, *monophyllous*,
or *one-leaved*. 552.

Monopterygius, *one-winged*. p.
144.

Monospermus, *monospermous*.
1030.

Monostachyos, *one-spiked*.

Montanus, *mountainous*. 1250.

Mucilaginosus s. *Mucilagineus*,
mucilaginous. p. 150.

Mucosus, *mucous*. 1327.

Mucro, *point*, or *dagger-point*.

Mucronatus, *mucronate*. p. 73.

Multangularis, *many-cornered*.

Multicapsularis, *many-capsuled*.

Multidentatus, *many-toothed*.

Multifidus, *many-cleft*.

Multiflorus, *many-flowered*.

Multilocularis, *many-celled*.

Multipartibilis, *many-partible*.
p. 99.

Multipartitus, *many-parted*.

Multiplex, *manifold*, or *many-*
rayed.

Multiplicatus, *multiplied*. 1189.

Multisiliquæ. See Vol. II. p.
325.

Multisiliquosus, *many-podded*.
p. 37.

Multivalvis, *many-valved*. 599.

Muniens, *fortifying*. 1237.

Munitus, *fortified*.

Murex, p. 145.

Muricatus, *muricated*. p. 117.

Murinus, *mouse-coloured*.

Musci, *mosses*. See p. 63. and
also Vol. II. p. 349.

Muticus, *awnless*. 604. 969.
1186.

Mutilatus, *mutilated*. 717.
1187.

NÆ:

Næmatothecium. See Vol. II.
p. 295.

Natans, *floating*. 146.

Naturalis, *natural*. 1359.

Nauseosus, *nauseous*. 1315.

Navicularis, *navicular*, or *boat-*
shaped.

Nectarinus, *nectarine*. 724.

Nectarium, *nectary*. 694.

Nemorosus, *shady*. 1246.

Nervosus, *nerved*.

Neuter, *neutral*, or *neuter*.

Nidorosus, *nidorous*. 1311.

Nidulans, *nidulant*. 1029. p.
133.

Niger, *black*. 133.

Nigricans, *blackish*. p. 87.

Nitidus, *glossy*. 216.

Nodosus, *knotty*. 990.

Nodus, *knot*.

Nucamentaceus, *nucamentaceous*.
p. 136.

Nucamentum: See *Amentum*.

Nucleus, *kernel*. 1103. p. 150.

Nudus, *naked*. 655. 814. 1115.
p. 74. 94. 113.

Nullus, *none*. p. 123.

Nutans, *nodding*. 38. 427. p.
71.

Nux, *nut*. 1102. p. 112.

OBC.

Obconicus, *obconical*.

Obcordatus, *obcordate*. 833.

Obliquus, *oblique*. 622.

Oblongiusculus, *somewhat ob-*
long.

Oblongo-ovatus, *oblongo-ovate*.

Oblongus, *oblong*. 162. p. 134.

Obovatus, *obovate*.

Obsolete, *indistinctly*.

Obsoletus, *indistinct*.

Obtusiusculus, *somewhat obtuse*.

Obtusus, *obtuse*.

Obversus, *obverse*. p. 131.
 Obvolutus, *obvolute*. 1165.
 Ochraceus, *ochrey*. p. 87. 138.
 Octandria. See pages 58 and 61.
 Octandrus, *octandrous*, or *eight-stamened*.
 Octofidus, *eight-cleft*.
 Octopartitus, *eight-parted*.
 Odor, *odour*. 1307.
 Oeconomia, *economy*. 1360.
 Oeconomicus, *economical*. 1368.
 Officinalis, *officinal*. 1365.
 Olivaceus, *olive-coloured*. p. 87.
 Opacus, *opaque*. p. 147.
 Operculatus, *lidded*.
 Operculum, *lid*. See p. 72.
 Opitulator. See Adductor.
 Oppositifolius, *oppositifolious*. 323.
 Oppositus, *opposite*. 99. 126. p. 106. 110. 131. 153. 167.
 Orbicularis s. orbiculatus, *orbicular*, or *circular*. 159. p. 134.
 Orbiculus, *a small orb*.
 Orchideæ. See Vol. II. p. 313.
 Ordo, *order*.
 Orgasticus, *orgastic*. 1316.
 Orgya, *fathom*. 1358.
 Orgyalis, *of a fathom*. 1358.
 Os, *mouth*.
 Osseus, *bony*. 1086. p. 116. 148.
 Ovalis, *oval*. 161.
 Ovarium, *ovary*. p. 69.
 Ovato-lanceolatus, *ovato-lanceolate*.
 Ovato-oblongus, *ovato-oblong*.
 Ovatus, *ovate*. 160. p. 134.
 Ovum, *ovule*, or *egg*.

PAG.

Pagina, *surface of a leaf*.
 Palatum, *palate*.

Palea, *chaff*. p. 125.
 Paleaceus, *paleaceous*, or *chaffy*. 1082. 1114. p. 125. 134. 141.
 Pallidus, *pale*.
 Palma, *hand*. 1353.
 Palmæ. See p. 59. and Vol. II. p. 307.
 Palmaris, *of a hand*. 1353.
 Palmatus, *palmate*. 14. 187.
 Palustris, *marshy*. 1242.
 Pan. 1361.
 Pandora. 1362.
 Panduræformis, *panduriform*. 182.
 Panicula, *panicle*. 466.
 Paniculatus, *panicled*. 91.
 Papilionaceæ. See Vol. II. p. 327.
 Papilionaceus, *papilionaceous*. 662.
 Papilla, *a nipple*. p. 130.
 Papillosus, *pimpled*. 233. p. 138.
 Pappiger, *pappus-bearing*.
 Papposus, *pappous*.
 Pappus, *pappus*. 1093. 1204. p. 139.
 Papulosus, *papulous*. 234.
 Parabolicus, *parabolic*. 163.
 Parallelopipedus, *parallelopiped*.
 Parallelus, *parallel*. 959. p. 110.
 Paraphysis, *a succulent thread*. p. 69.
 Parasiticus, *parasitical*. 1258.
 Parenchyma, p. 161.
 Parietalis, *parietal*. p. 107. 109.
 Pars, *part*.
 Partialis, *partial*. 399. 457. 590. p. 100.
 Partibilis, *partible*. p. 98.
 Partitus, *parted*. 185. p. 110. 167.
 Parvus, *small*. p. 137.
 Pascua. See 1368.
 Pastoralis, *pastoral*. 1368.

Patelliformis, *patelliform*. p. 172.
 Patens, *spreading*. 93. 133. 661.
 Patulus, *patulous*, somewhat spreading. See Patens.
 Pauciflorus, *few-flowered*.
 Pectinatus. Pectiniformis, *comb-like*, or *pectinate*.
 Pedalis, *of a foot*. 1356.
 Pedatifidus, *pedatifid*.
 Pedatus, *pedate*. 281.
 Pedicellatus, *pedicelled*. 849. 1001.
 Pedicellus, *pedicel*. 401.
 Pedunculatus, *peduncled*. 477. 493.
 Pedunculus, *peduncle*. 398.* p. 70.
 Pellucidus, *pellucid*.
 Pelta, *target*, the fructification of some Lichens.
 Peltatus, *peltate*. 149.
 Pendulus, *pendulous*. 430. p. 71. 127.
 Penicilliformis, *pencil-form*.
 Pennatus, *pennate*.
 Pentacoccus, *five-grained*.
 Pentagonus, *five-cornered*.
 Pentagynia. See p. 60.
 Pentagynus, *pentagynous*.
 Pentandria. See p. 58 and 61.
 Pentandrus, *pentandrous*.
 Pentapetalus, *five-petalled*.
 Pentaphyllus, *five-leaved*.
 Pepo, *gourd*. p. 118.
 Perennis, *perennial*. 3. 275.
 Perfectus, *perfect*. p. 171.
 Perfoliatus, *perfoliate*. 155.
 Perforatus, *perforated*. 1218. p. 109.
 Perianthium, *perianth*. 544.
 Pericarpium, *pericarp*. 918. p. 110.
 Perichætiæ. See p. 66.
 Perigoniale, *perigonal*.
 Perigonium. p. 66. 247.

Perigynanda has the same signification as Perigonium. See p. 247.
 Peristoma, *peristome*. p. 73.
 Perpendicularis, *perpendicular*. 17.
 Perpetuus, *perpetual*. 1302.
 Persistens, *persisting*. 274. 326. 548. 581. 687. 874. 916. p. 140.
 Personatus, *personate*. 658.
 Personatæ. See Vol. II. p. 335.
 Pertusus, *punched*.
 Perula, *pouch*. Persoon.
 Pervius, *pervious*. 66.
 Pes, *foot*. 1356.
 Petaliformis, *petal-form*.
 Petalinus, *petaline*. 696.
 Petaloideus, *petaloid*.
 Petalum, *petal*. 629.
 Petiolaris, *petiolar*. 349. 1152.
 Petiolatus, *petioled*. 148.
 Petiolulus, *petiolule*.
 Petiolus, *petiole*. 289.
 Phyllophorus, *leaf-bearing*. p. 163.
 Pileatus, *pileate*.
 Pileus, *pileus*. p. 85.
 Pilifer s. Piliger, *hair-bearing*, or *hair-pointed*. p. 66.
 Pilosus, *hairy*. 241.
 Pilus, *hair*.
 Pinguis, *fat*. 1323.
 Pinna. See p. 248.
 Pinnatifidus, *pinnatifid*. 189.
 Pinnatus, *pinnate*. 283.
 Pinnula, *pinnule*.
 Pinnulatus, *pinnulate*.
 Piperatus, *peppery*. p. 85.
 Piperitæ. See Vol. II. p. 309.
 Pistillaceus, *pistillaceous*. 699.
 Pistillifer, *pistilliferous*.
 Pistillum, *pistil*. 824.
 Placentatio, *placentation*. 1214.
 Planta, *plant*.

PLA.

Planiusculus, *flattish*.
 Planus, *flat*. 709. 1190.
 Plenus, *full*. 1190.
 Plicatus, *plaited*, or *folded*. 251.
 1166. 1182.
 Plumbeus, *lead-coloured*. p. 139.
 Plumosus, *feathery*. 365. 1096.
tufted. p. 84.
 Plumula, *plumule*. 1089. p. 174.
 Plurilocularis, *many-celled*. p.
 120.
 Pollen, *pollen*. 823.
 Pollex, *inch*. 1352.
 Pollicaris, *of an inch*. 1352.
 Polyadelphia. See p. 59.
 Polyadelphus, *polyadelphous*.
 Polyandria. See pages 58 and
 61.
 Polyandrus, *polyandrous*.
 Polyanthos, *many-flowered*.
 Polycotyledonis s. Polycotyle-
 doneus, *polycotyledonous*. 1228.
 p. 165.
 Polygamia. See pages 59 and
 61.
 Polygamus, *polygamous*.
 Polygynia. See p. 60.
 Polypetalus, *many-petalled*. 628.
 Polyphyllus, *many-leaved*.
 Polyspermus, *many-seeded*.
 Polystachius, *many-spiked*.
 Pomaceæ. See Vol. II. p. 330.
 Pomona. See 1368.
 Pomum, *pome*. 1023. p. 118.
 Porulus, *porule*. p. 90.
 Porus, *pore*. p. 90.
 Posticus, *posterior*.
 Præcox, *early*. 1262.
 Præmorsus, *pre-morse*. 7. 207.
 Pratensis, *meadowy*. 1248.
 Preciæ. See Vol. II. p. 322.
 Primicerus s. Primordialis, *pri-
 mordial*. p. 64.
 Prismaticus, *prismatic*.
 Procumbens, *procumbent*. 40.

PRO.

285

Prolifer, *proliferous*. 84. 458.
 1191.
 Prominens, *prominent*.
 Prominulus, *prominulous*.
 Pronus, *prone*.
 Propagineus, *propagineous*.
 1216.
 Propago, 1104. See Bud. 204.
 Proprius, *proper*. 551. 591.
 695. 1109. p. 101.
 Prostratus, *prostrate*.
 Pruina, *hoariness*. p. 146.
 Pubes, *pubescence*. 355.* p.
 146.
 Pubescens, *pubescent*. 871.
 Pulposus, *pulpy*. 263. 995.
 Pulveratus s. Pulverulentus,
powdery. p. 84.
 Pulvinatus, *cushion-like*. p. 86.
 Punctatus, *dotted*, or *punctate*.
 232. 1112. p. 138.
 Punctularis, *puncticular*. p.
 176.
 Punctulatus, *puncticulate*.
 Pungens, *pungent*.
 Purpurascens, *purplish*, or *be-
 coming purple*. p. 87.
 Purpureus, *purple*. 1332. p. 84.
 Pustulosus, *pustular*.
 Putamen. p. 108. 116.
 Putamineæ. See Vol. II. p.
 324.
 Pyramidatus, *pyramidal*. p. 73.
 172.
 Pyriformis, *pyriform*. p. 72.
 Pyrena, *pyrene*. p. 108.

QUA.

Quadrangularis, *quadrangular*.
 Quadricapsularis, *four-capsu-
 led*.
 Qualitas, *quality*. p. 53.
 Quadripartibilis, *four-partible*.
 p. 98.
 Quaternus, *four together*. p. 97.
 Quinatus, *quinate*.

Quinquangularis, *five-cornered*.
 Quinquefidus, *five-cleft*.
 Quinquelobus, *five-lobed*.
 Quinquelocularis, *five-celled*.
 Quinquepartibilis, *five-partible*.
 p. 99.
 Quinquepartitus, *five-parted*.
 Quinque-valvis, *five-valved*.
 Quinus, *five-together*. p. 97.

RAC.

Racemus, *raceme*. 465.
 Rachis, *rachis*, or *midrib*. 1140.
 Radians, *radiating*.
 Radiatus, *radiate*. 692. 900.
 Radicalis, *radical*, or *root-*.
 Radicans, *rooting*. 44. 147.
 Radicatus, *rooted*.
 Radicatio, *radication*.
 Radicula, *radicle*. p. 176.
 Radiculosus, *radiculose*. p. 65.
 Radiolus, *raylet*.
 Radius, *ray*.
 Radix, *root*. p. 1.
 Rameus, *rameous*, or *branch-*.
 112.
 Ramificatio, *ramification*.
 Ramosissimus, *very much branch-*.
ed. 89.
 Ramosus, *branched*. 5. 88. 364.
 Ramus, *branch*. p. 5.
 Ramulus, *branchlet*.
 Receptacularis s. Receptacula-
 ceus, *receptacular*. 700. 723.
 Receptaculum, *receptacle*. 1105.
 p. 123. 126.
 Reciprocus, *reciprocal*. 1179.
 Reclinans, *reclining*.
 Reclinatus, *reclined*. 137.
 Reclusio, *shutting*. 1287.
 Rectembryus, *rectembryous*.
 Rectus, *straight*. 609. 621. p.
 135. 168.
 Recurvatus s. Recurvus, *re-*
curved. 138. p. 71.
 Reductus, *reduced*. 1220.

Reflexus, *reflected*. 558.
 Refractus, *refracted*.
 Regelatio, *thaw*. 1281.
 Regularis, *regular*. 637. p. 88.
 Remotissimus, *very remote*. 625.
 Remotus, *remote*. 125.
 Reniformis, *reniform*. 77.
 Repandus, *repand*. 200. p. 169.
 Repens, *creeping*. 8. 43.
 Reptans, *creeping*.
 Restans, *remaining*.
 Resupinatio, *resupination*.
 Resupinatus, *resupinate*, or *re-*
versed. 144. 1180.
 Reticulatus, *reticulated*. p. 66.
 75. 90. 138.
 Retroflexus, *retroflexed*. 107.
 Retrofactus, *retrofracted*. 433.
 Retrorsum, *backwards*.
 Retusus, *retuse*.
 Revolutus, *revolute*. 139. 355.
 1162.
 Rhœadeæ. See Vol. II. p. 325.
 Rhombeus, *rhombed*. 174.
 Rhomboideus, *rhomboidal*.
 Rictus, *gape*. 657.
 Rigidus, *rigid*. 32. 131.
 Rimosus, *chinky*. 63. p. 155.
 168.
 Ringens, *ringent*. 648.
 Rorulentus, *dewy*. p. 146.
 Ros, *dew*. p. 146.
 Rosaceus, *rosaceous*. 666.
 Roseus, *rose-coloured*. p. 87.
 Rostellum, *rostel*. 1090.
 Rostratus, *rostrate*, or *beaked*.
 769. p. 73.
 Rostrum, *beak*. p. 73. 143.
 Rotaceæ. See Vol. II. p. 322.
 Rotatus, *rotate*. 645.
 Rotundatus, *rounded*. 166.
 Rubellus s. Rufus, *reddish*. p.
 87.
 Ruber, *red*. 1338.
 Rubiginus s. Rubiginosus,
rust-coloured. p. 87.

Ruderalis s. Ruderatus, *rubbishy*.
1252.

Rufescens, *becoming red*. p. 87.
130.

Rugosus, *wrinkled*. 228. p. 138.

Ruminatus, *ruminate*. p. 155.
168.

Runcinatus, *runcinate*. 181.

Rutilus, *fiery*. p. 139.

SAG.

Sagittatus, *sagittatus*. 179.

Salsus, *saline*, or *salt*. 1241.

Samara. p. 111.

Sanguineus, *blood-colour*. p. 87.

Sapor, *taste*. 1318.—1328.

Sarmentosus, *sarmentous*. 42.

Sarcocarpum. See Vol. II. p.
291.

Sarcothecium. See Vol. II.
p. 291.

Sarmentaceæ. See Vol. II. p.
317.

Sarmentum, *runner*.

Scaber, *rough*. 69. 42.

Scabratus, *roughened*. p. 117.

Scabridæ. See Vol. II. p. 348.

Scabrities, *roughness*.

Scandens, *scandent*, or *climbing*.
47.

Scapus, *scape*. 21. p. 175.

Scariosus, *scariose*. 255.

Scitamineæ. See Vol. II. p.
314.

Sclerocarpum. See Vol. II. p. 288

Scobiformis, *sawdust-like*. 1036.
p. 134.

Scrinum, according to Scopoli,
is a species of pericarp, com-
posed of three involucre, one
woody, another pulpy, and
the third, or innermost, mem-
branous, and opening.

Scrobiculatus, *scrobiculate*. p.
124. 138.

Scrotiformis, *purse-like*. 702. 924.

Scruposus, *rugged*. p. 75.

Scutellum, *shield*.

Scyphiferus, *cup-bearing*.

Scyphiformis, *cup-form*.

Scyphus, *cup*.

Sebaceus, *sebaceous*. p. 154.

Secundarius, *secondary*. p. 64.

Secundus, *one-rowed*. 526.

Securiformis, *axe-shaped*.

Segregatus, *segregate*. p. 100.

Sejunctus, *distinct*. p. 89.

Semen, *seed*. p. 130.

Semi-amplexicaulis, *half-embra-
cing the stem*.

Semicircularis, *semicircular*. p.
86.

Semicylindricus, *semicylindrical*.

Semiflosculosus, *semifloscular*.

Seminalis, *seminal*, or *seed*. 109.

Seminatio, *semination*. 1201.

Semiorbiculatus, *hemispherical*.

Semiteres, *semicolumnar*. 295.

Sempervirens, *evergreen*. 276.

Sensilis, *sensitive*. 1301.

Senticosæ. See Vol. II. p.
330.

Senus, *six-together*. p. 97.

Separatus, *separate*. p. 100.

Septalis, *septal*. p. 128.

Septipendulus, *septipendulous*.
p. 133.

Septum, *dissepiment*.

Sepiariæ. See Vol. II. p. 339.

Sericeus, *silky*, or *satiny*. 238.

Serotinus, *late*. 1264.

Serpentinus, *serpentine*. p. 173.

Serratus, *serrated*. 195.

Serrulatus, *serrulated*.

Sessilis, *sessile*. 150. 492. p.
127. 140.

Setaceus, *setaceous*. p. 141.

Seta, *bristle*. 361.

Setifer, *bristle-bearing*, or *bris-
tle-pointed*.

Setosus, *bristly*, or *bristled*. p.
125.

Setula, a small bristle. p. 70.
Sexangularis, six-cornered.
Sexfidus, six-cleft.
Sexlocularis, six-celled.
Siccus, dry. 1022. 1320.
Sigmoideus, sigmoid. p. 169.
 173
Silicula, silicle. 955.
Siliculosa. See p. 61.
Siliculosus, siliculous.
Siliqua, silique. 955. p. 121.
Siliquosa. See p. 61.
Siliquosæ. See Vol. II. p.
 334.
Siliquosus, siliquose. p. 112.
Simplex, simple, or single. 81.
 454. p. 74. 106. 175.
Simplicissimus, very simple.
Sinistrorsum, from left to right.
Sinuato-dentatus, sinuato-den-
 tate.
Sinuatus, sinuated. 190.
Sinus, indentation.
Situs, situation.
Solidus, solid. 27. 1147. p.
 118.
Solitarius, solitary. 318.
Solum, soil.
Somnus, sleep. 1288.
Sordide flavus, dirty yellow.
Spadiceus, bay. p. 87; or *spa-*
diceous, having a spadix.
Spadix, spadix. 451. 1141.
Sparsus, scattered. 97. 118.
Spatha, spathe. 616.
Spathaceæ. See Vol. II. p.
 315.
Spathaceus, spathaceous.
Spatulatus, spatulate. 165.
Species, species.
Specificus, specific.
Spermatocystidium, anther, a
 term used by Hedwig to de-
 note the vessel, which con-
 tains the sperm of the male
 organs in the Musci, &c.

Sphæricus, spherical.
Spika, spike. 461.
Spicatus, spiked. 536.
Spiciformis, spike-like.
Spicula, spikelet.
Spina, thorn. 384. p. 145.
Spinescens, spinescent.
Spinosus, thorny. 75. 198. p.
 141.
Spiralis, spiral. 711. p. 173.
Spirans, breathing. 1312.
Spithama, span. 1354.
Spithamæus, of a span. 1354.
Splendens, shining. p. 137.
Sponsalia, nuptials. 1196.
Spongiosus, spongy. p. 126.
 148.
Spora, seed, or ovule.
Sporangium s. **Sporangidium**,
 a pericarp, the part containing
 the seeds. These terms are
 used by Hedwig.
Spurius, spurious. p. 112. 119.
 121. 122.
Squama, scale. p. 145.
Squamatus, scaled, or
Squamosus, scaly. 60. 1149.
Squarrosus, squarrose. 584.
Stamen. 706.
Stamineus, stamineous. 698.
Staminifer, staminiferous, or
 stamen-bearing.
Statio, station. p. 49.
Stella, star.
Stellatæ. See Vol. II. p. 342.
Stellatus, stellate. 128. 366. p.
 141.
Sterilis, barren. 819.
Stigma, stigma. 876.
Stimulus, sting. 391.
Stipes, stipe, or stalk. 1094. p.
 83.
Stipitatus, stipitate. 1094. p.
 127. 140.
Stipula, stipule. 316.
Stipularis, stipular. 77. 1153.

Stipulatio, *stipulation*.
 Stipulatus, *stipuled*.
 Stolo, *stolon*.
 Stolonifer, *stoloniferous*.
 Stramineus, *straw*, or *buff*
colour p. 87.
 Stria, *streak*.
 Striatus, *striated*. p. 137.
 Strictus, *stiff and straight*. 31.
 130.
 Striga, a lanceolate bristle, or
 thorn.
 Strigose, *strigose*. 245.
 Strobilaceus, *strobilaceous*.
 Strobilus, *strobile*. 463. 1031.
 Strophium, *strophium*. p. 145.
 Structura, *structure*. 1213.
 Stylus, *style*. 853.
 Stypticus, *styptic*. 1324.
 Sub, in composition, often de-
 notes that the term, to which
 it is prefixed, is to be taken
 with some reserve, e. g. *subo-*
vatus somewhat ovate; *subbi-*
florus mostly two-flowered.
 Subalaris. See Axillaris.
 Subcinereus. See Cinerascens.
 Subcordatus, *somewhat cordate*.
 Subdivisus, *subdivided*.
 Suberosus, *cork-like*. p. 126.
 Subfuscus, *brownish*. p. 87.
 Subintegerrimus, *almost entire*.
 Submersus, *submersed*. 145.
 Subniger, *blackish*. p. 87.
 Subramosus, *somewhat branched*.
 Subrotundus, *roundish*. 158.
 499.
 Subscaber, *roughish*. p. 117.
 Substramineus, *somewhat straw-*
coloured. p. 87.
 Subspongiosus, *somewhat spongy*.
 p. 149.
 Subviridis, *greenish*. p. 87.
 Subulatus, *subulate*. 269.
 Succedaneus, *succedaneous*. p.
 64.

Succosus, *juicy*.
 Succulentæ. See Vol. II. p.
 318.
 Succulentus, *succulent*. 1021.
 Suffrutex, *under-shrub*.
 Suffruticosus, *somewhat shrubby*.
 24.
 Sulcatus, *furrowed*. 67. 226.
 p. 137. 155.
 Superficialis, *superficial*. p. 130.
 Superficies, *surface*.
 Superfluous, *superfluous*.
 Superus, *superior*. 577. 846.
 p. 101. 123.
 Supinus, *supine*.
 Supradecompositus, *superdecom-*
pound.
 Suprafoliaceus, *suprafoliaceous*.
 Surculus, *shoot*.
 Sutura, *suture*.
 Sylvaticus, *woody*. 1247.
 Syngenesia. See pages 59 and
 62.
 Syngenesista s. Syngenesius,
syngenesious.
 Systema, *system*. See Method.

TAB.

Tabescens. See Marcescens.
 Tactus, *touch*. 1339.
 Tectus, *covered*. 812. p. 94.
 Tempus, *time*. p. 51.
 Tenax, *tough*.
 Tener, *tender*.
 Tenuifolius, *slender-leaved*.
 1185.
 Tenuis, *slender*. 859.
 Teres, *columnar, cylindrical, or*
destitute of angles.
 Teretiusculus, *roundish*.
 Tergeminus, *tergeminat*. 287.
 Terminalis, *terminating, or*
terminal. 385. 607.
 Ternarius, *ternary*. p. 115.
 Ternatus, *ternate*. 280. p. 97.
 Ternus, *three together*. 122.

Terra, *earth*. p. 50.
 Tessellatus, *tessellated*.
 Testa, *shell*. p. 147.
 Testaceus, *tile-coloured*. p. 87.
 Teter, *nasty*. 1313.
 Tetradinamia. p. 58.
 Tetradinamus s. Tetradinamicus, *tetradinamous*.
 Tetraedrus, *tetraedrous*, or *four-sided*.
 Tetragonus, *four-cornered*.
 Tetragynia. See p. 60.
 Tetragynus, *tetragynous*.
 Tetrandria. See p. 58.
 Tetrandrus, *tetrandrous*.
 Tetrapetalus, *four-petalled*.
 Tetraphyllus, *four-leaved*.
 Tetraspermus, *four-seeded*.
 Thalamus, *receptacle*. Gærtn.
 Theca, *case*. p. 71. Theca, according to Scopoli, is a pericarp composed of a double involucre, the outer opening, the inner inwrapping the seed; as in *Euonymus*.
 Thyrsus, *thyse*. 467.
 Tinctorius, *belonging to dying*. 1368.
 Tomentosus, *tomentous*. 71. 237.
 Tomentum, *tomentum*. 359. p. 146.
 Torosus, *torose*. 957. 993.
 Torulosus, *torulose*. 957.
 Torsio, *twisting*. 1174.
 Tortilis, *twisted*. 610.
 Tortus, *twisted*. 670.
 Tracheæ, *air-vessels*. p. 161.
 Transversus s. Transversalis, *transverse*. 960. p. 110. 167.
 Trapeziformis, *trapeziform*. 175.
 Trialatus, *three-winged*. p. 144.
 Triandria. See pages 58 and 61.
 Triandrus, *triandrous*.

Triangularis, *triangular*.
 Tribus, *a tribe*.
 Tricapsularis, *three-capsuled*.
 Trichotomus, *trichotomous*.
 Tricoccæ. See Vol. II. p. 333.
 Tricoccus, *tricoccous*.
 Tricuspidatus, *three-pointed*.
 Tridentatus, *three-toothed*.
 Triduus, *triduous*. 1304.
 Trifidus, *three-cleft*. 183.
 Triflorus, *three-flowered*.
 Trigonus, *three-cornered*.
 Trigynia. See p. 60.
 Trigynus, *trigynous*.
 Trihilatæ. See Vol. II. p. 323.
 Trijugus, *three-paired*.
 Trilobatus s. Trilobus, *three-lobed*.
 Trilocularis, *three-celled*.
 Trinervatus s. Trinervis, *three-nerved*.
 Trioecia. See p. 62.
 Trioicus, *trioicous*.
 Tripartibilis, *three-partible*. p. 98.
 Tripartitus, *three-parted*.
 Tripetaloidæ. See Vol. II. p. 312.
 Tripetalus, *three-petalled*.
 Triphyllus, *three-leaved*.
 Tripinnatus, *tripinnate*.
 Triplinervis, *triple-nerved*.
 Tripterygius, *three-winged*. p. 144.
 Triqueter, *triquetrous*, or *three-sided*. 55.
 Trispermus, *three-seeded*.
 Trisulcus, *three-furrowed*. 939.
 Triternatus, *triternate*.
 Trivalvis, *three-valved*.
 Trivialis, *trivial*.
 Trochlearis, *pulley-like*. p. 172.
 Tropicus, *tropical*. 1285.
 Truncatus, *truncated*. 288.

Truncus, *trunk*. p. 2.
 Tubæformis, *trumpet-form*. p. 69.
 Tuber, *knob*.
 Tuberculatus s. Tuberculosus, *tubercled*. 977, p. 125. 138. 176.
 Tuberculum, *tubercle*.
 Tuberosus, *tuberous*.
 Tubulatus s. Tubulosus, *tubular*. 262. 691. 792. p. 83.
 Tubus, *tube*. 630. p. 89.
 Tunicatus, *coated*. 64. 1148. p. 94.
 Turbinatus, *turbinate*. 586. p. 135.
 Turgidus, *turgid*. 992. p. 166.
 Turio, a young tender shoot, as of the Hop and Asparagus.
 Turionifer, *shoot-bearing*. p. 163.

ULI.

Uliginosus, *uliginous*. 1244.
 Umbella, *umbel*. 453. 1123.
 Umbellatæ. See Vol. II. p. 339.
 Umbellatus, *umbellate*. 420.
 Umbellifer, *umbelliferous*.
 Umbellula, *umbellet*.
 Umbilicatus, *umbilicate*. 898. p. 86.
 Umbilicus, *navel*. p. 120.
 Umbo, *boss*.
 Umbonatus, *bossed*. p. 86.
 Umbraculiformis, *umbrella-shaped*. p. 71.
 Unangulatus, *one-edged*.
 Uncinatus, *uncinate*, or *hooked*. p. 168. 173.
 Undatus s. Undulatus, *undulated*. 252. p. 169.
 Ungicularis, of a nail. 1351.
 Ungiculatus, *clawed*, p. 89. 1351.
 Unguis, a *claw*, or *nail*. 631. 1351.
 Ungulatus, *ungulate*.

Unialatus, *one-winged*. p. 144.
 Unicus, *single*. 478.
 Uniflorus, *one-flowered*. 595.
 Uniformis, *uniform*. p. 88. 135. 140.
 Unilateralis, *unilateral*, or *one-sided*. 525. 1219. p. 128. 153.
 Unilocularis, *one-celled*. 597. 617.
 Univalvis, *one-valved*. 597. 617.
 Unisexualis, *unisexual*.
 Universalis, *universal*. 456. 589.
 Urceolatus, *urceolate*. 647. 883.
 Urens, *stinging*. 76.
 Usus, *use*. p. 55.
 Utriculus, *utricle*. 369. p. 111.

VAG.

Vagina, *sheath*.
 Vaginalis, *vaginal*. p. 152.
 Vaginans, *sheathing*. 157. p. 170.
 Vaginatus, *sheathed*.
 Vaginula, a *little sheath*. p. 70.
 Vagus, *vague*. p. 128. 133.
 Valva s. Valvula, a *valve*. 948. p. 105.
 Valvatus s. Valvis, *valved*.
 Valvipendulus, *valvipendulous*. p. 133.
 Variatio, *variation*. 1181.
 Variegatus, *variegated*. p. 87.
 Varietas, *variety*.
 Varius, *various*. p. 125.
 Velatus, *veiled*. p. 84. 94.
 Velum, *curtain*, or *veil*. p. 85.
 Velutinus, *velvety*. p. 84.
 Vena, *vein*. p. 91.
 Venoso-reticulatus, *venoso-reticulated*. 973.
 Venosus, *veined*. 227.
 Venter, *belly*. p. 105. 132.
 Ventralis, *ventral*. p. 110.
 Ventricosus, *ventricose*. 933.
 Ventriculosus, *ventriculous*.

- Vepreculæ. See Vol. II. p. 327.
 Vermicularis s. Vermiculatus, *vermicular*, or *vermiculate*. p. 138. 169.
 Vernatio, *vernation*. 1158. 1261.
 Verruca, *wart*. p. 145.
 Verrucosus, *verrucose*, or *warty*. p. 86.
 Versatilis, *versatile*. 787.
 Verticalis, *vertical*. 143. p. 110. 121.
 Verticillatæ. See Vol. II. p. 337.
 Verticillatus, *verticillate*. p. 106. 167.
 Verticillus, *verticil*. 470.
 Vesicula, *vesicle*.
 Vesicularis, *vesicular*.
 Vexillum, *standard*. 664.
 Vigiliæ, *vigils*, or *watchings*. 1283.
 Villosus, *villous*. 72. 236.

- Villus, *soft hair*. p. 146.
 Violaceus, *violet*. 1333. p. 87.
 Vires, *powers*. 1367.
 Virescens, *greenish*, or *becoming green*. p. 87.
 Virgatus, *rodlike*. 90.
 Viridis, *green*. 1335.
 Virosus, *poisonous*. 1317.
 Viscidus, *viscid*. 235. p. 85.
 Viscositas, *viscosity*. 376. 121.
 Vitellus. p. 156.
 Viviparus, *viviparous*. 1194.
 Volubilis, *twining*, or *voluble*. 48.
 Volutus, *volute*. p. 169.
 Volva, *curtain*. 623. *wrapper*. p. 83.
 Volvatus, *volvate*.

ZON.

- Zona, *zone*.
 Zonalis, *zonal*.
 Zonatus, *zoned*. p. 87.

EX

Fig

Fig

Fi

EXPLANATION OF THE PLATES.

PLATE I.

ROOTS.

- | | |
|--------------------------|-------------------------|
| Fig. 1. A Branched root. | Fig. 5. A Palmate root. |
| 2. A Fusiform root. | 6. A Solid bulb. |
| 3. A Creeping root. | 7. A Coated bulb. |
| 4. A Tuberous root. | 8. A Scaly bulb. |

PLATE II.

STEMS.

- | | |
|---|--------------------------|
| Fig. 1. A Jointed Culm. | Fig. 4. A Creeping Stem. |
| 2. A Scape. | 5. 6. Voluble Stems. |
| 3. A Frond. a. the
Stipe. b. the Leaf.
c. the Midrib. | 7. A Dichotomous Stem. |
| | 8. A Brachiate Stem. |

PLATE III.

DETERMINATE LEAVES.

- | | |
|-------------------------|---------------------------|
| Fig. 1. a. A Seed-leaf. | Fig. 2. a. Four together. |
| b. A Root-leaf. | b. Stellate. |
| c. c. Stem-leaves. | c. Opposite. |
| d. A Branch-leaf. | c. c. Decussated. |
| e. An Axillary leaf. | d. Imbricated. |
| f. A Bracte. | e. Acerose. |
| g. g. Alternate leaves. | f. Fascicled. |
| h. A Floral leaf. | g. Jointed. |

- Fig. 3. *a.* Inflected.
b. Erect.
c. Spreading.
d. Horizontal.
e. Reclined.
f. Somewhat Imbricated.
g. Revolute.

- Fig. 4. *a.* Petioled.
b. Peltate.
c. Sessile.
d. Decurrent.
e. Stem-clasping.
f. Perfoliate.
g. Connate.
h. Sheathing.

FULCRES.

- Fig. 5. *a.* Stipules.
b. A Tendril.
c. Concave Glands.
d. Pedicelled Glands.

- Fig. 6. *a.* Simple Prickles.
b. A Double Prickle.
c. A Triple Prickle.
 Fig. 7. *a.* A Simple Thorn.
b. A Triple Thorn.

PLATE IV.

SIMPLE LEAVES.

- Fig. 1. Orbicular.
 2. Roundish.
 3. Ovate.
 4. Oval.
 5. Oblong.
 6. Lanceolate.
 7. Linear.
 8. Subulate.
 9. Reniform.
 10. Cordate.
 11. Crescent-shaped.
 12. Triangular.
 13. Sagittate.
 14. Cordato-sagittate.
 15. Hastate.
 16. Obcordate.
 17. Three-lobed.
 18. Premorse.
 19. Lobed.
 20. Five-angled.
 21. Eroded.
 22. Palmate.
 23. Pinnatifid.
 24. Laciniated.
 25. Sinuated.

- Fig. 26. Dentato-sinuated.
 27. Runcinate.
 28. Parted.
 29. Repand.
 30. Toothed.
 31. Serrated.
 32. Doubly serrated.
 33. Doubly crenate.
 34. Cartilaginous.
 35. Acutely crenate.
 36. Obtusely crenate.
 37. Plaited.
 38. Panduriform.
 39. Spatulate.
 40. Obtuse.
 41. Acute.
 42. Acuminate.
 43. Obtuse with a point.
 44. Acutely emarginate.
 45. Cuneiform.
 46. Retuse.
 47. Hairy.
 48. Tomentous.
 49. Hispid.
 50. Ciliate.

Fig. 51. Rhombed.

52. Veined.

53. Nerved.

54. Pimpled.

55. Parabolic.

56. Acinaciform.

57. Dolabriform.

Fig. 58. Deltoid.

59. Triquetrous or Three-sided.

60. Channelled.

61. Furrowed.

62. Without angles, or Cylindrical.

PLATE V.

COMPOUND LEAVES.

Fig. 1. Binate.

2. Ternate with sessile leaflets.

3. Ternate with petioled leaflets.

4. Digitate.

5. Pedate.

6. Pinnate with an odd leaflet.

7. Pinnate abruptly.

8. Pinnate alternately.

9. Pinnate interruptedly.

Fig. 10. Pinnate, tendrilled.

11. Truncated.

12. Pinnate decursively.

13. Pinnate jointedly.

14. Lyrate.

15. Biternate.

16. Bipinnate.

17. Triternate.

18. Tripinnate, without an odd leaflet.

19. Tripinnate, with an odd leaflet.

Obs. The Truncated and Lyrate Leaves fig. 11 and 14. are not compound leaves.

PLATE VI.

PARTS OF FRUCTIFICATION.

Fig. 1. *a.* A Spathe. *b.* The Peduncle with the Corol, &c.

2. A Campanulate Corol. *a.* The Perianth. *b.* The Corol.

3. A Funnel-shaped Corol, with the Calyx.

4. A Hypocrateriform Corol. *a.* The Tube. *b.* The Limbus.

5. A Strobile.

6. *a.* A Spathe. *b.* A Spadix.

6.* *a.* A Glume. *b.* An Awn, arising from the corol-glume.

7. A Flower, with the petals removed. *a.* The Perianth. *b.* The Germen. *c.* The Style. *d.* The Stigma.

e. e. e. The Filaments. *f.* An entire Anther. *g.* An Anther bursting and discharging the pollen. *h.* The Pollen. *i.* Deflorate Anthers, or anthers which have discharged their pollen.

- Fig. 8. A Cruciform, or Cross-shaped Corol, consisting of four petals. *a. a.* The Claws of the Petals. *b. b.* The Laminas of the petals. *c.* The Receptacle, or part in which the claws of the petals, &c. are inserted.
9. A Stamen. *a.* The Filament. *b.* The Anther.
10. A Pistil. *a.* The Germen. *b.* The Style. *c.* The Stigma.
11. A Ringent Corol. *a.* The Helmet, or Upper Lip. *b.* The Lower Lip. *c.* The Tube. *d.* The Throat.
12. A Flower with a double Perianth. *a.* The Perianth of the Fruit. *b.* The Perianth of the Flower.
13. A Personate Corol. *a.* The Upper Lip. *b.* The Lower Lip. *c.* The Palate.
14. A Rotate, or Wheelshaped Corol.
15. A Papillionaceous Corol, and the parts of the flower separately displayed. *a.* The Calyx. *b.* The Keel. *c.* One of the Wings. *d.* The Standard. *e.* The ten Stamens, and the Pistil.
16. *a.* A naked, dotted Receptacle. *b.* The reflected Calyx.
17. A Tubular Floret of a Compound Flower. *a.* The Germen, which becomes a naked seed. *b.* The Corol. *c.* The united Anthers. *d.* The Pistil.
18. A Ligulate and a Tubular Floret of a Compound Radiate Flower. *a.* The entire Ligulate floret. *b.* The Pistil. *c.* The entire Tubular floret. *d.* The Stamens and Pistil.
19. A Ligulate Floret, toothed at the summit of the petal. *a.* The Seed. *b.* The sessile Pappus.
20. A Seed with a stipitate villous Pappus. *a.* The Seed. *b.* The Stipe. *c.* The Pappus.
21. A Seed with a stipitate feathery Pappus. *a.* The Seed. *b.* The Stipe. *c.* The Pappus.
22. The Flower of a *Narcissus*. *a.* The Nectary surrounded by the six Petals.

PLATE VII.

KINDS OF INFLORESCENCE.

- Fig. 1. A Spike. *a. a.* Spikelets.
2. A Corymb. *a. a.* The Pedicels.
3. A Raceme.
4. A Panicle.
5. An Universal Umbel. *a. a. a. a.* Partial Umbels, or Umbellets. *b. b.* The Universal Involucre. *c. c. c.* The Partial Involucres, or Involucrets. *d. d. d. d.* The Rays of the Umbel.

EXPLANATION OF THE PLATES. PLATE VII. 237

- Fig. 6. A Stem with Verticillate Flowers. *a. a. a.* The Verticils.
7. An Ament.
8. A Compound Flower, consisting entirely of tubular florets. *a.* The imbricated calyx. *b.* The tubular florets.
9. A Compound Radiate Flower. *a.* The tubular florets of the Disk or Centre. *b. b.* The ligulate florets of the Ray, or Circumference.
10. A Compound Flower, composed entirely of ligulate florets. *a.* The Calyx. *b.* The Calycle.
11. A Cyme.
12. A Compound Flower, belonging to the order of Polygamia Frustranea. *a.* The fertile tubular florets of the Disk. *b. b.* The barren or neuter tubular florets of the Ray.

PLATE VIII.

FRUITS.

- Fig. 1. An Obcordate Silicle.
2. A Capsule opening horizontally. *a.* The bottom. *b.* The Lid.
3. A Capsule divided vertically or lengthways. *a.* The Seeds. *b.* The Receptacle of the seeds.
4. A Three-valved Capsule, opening at the top. *a. a. a.* The points of the valves.
5. A Silicle with a transverse or contrary Dissepiment. *a. a.* The Valves. *b.* The Dissepiment.
6. A Silicle with a parallel Dissepiment. *a. a.* The Valves. *b.* The Dissepiment.
7. A Follicle. *a.* The longitudinal Opening. *b.* The Receptacle of the Seeds.
8. A Pome cut across to shew *a. a.* The Capsule. *b. b.* The Seeds.
9. A Drupe divided longitudinally. *a.* The Pulp. *b.* The Shell. *c.* The Kernel.
10. A Capsule cut transversely. *a. a. a. a.* The Receptacles and Seeds. *b. b. b. b.* The Dissepiments. *c.* The Column. *d. d. d. d.* The Valves.
11. A Compound Berry. *a. a.* The Granules (*Acini*).
12. A Berry divided horizontally. *a. a. a.* The Seeds. *b.* The Pulp.
13. The Fruit of the Yew Tree (*Taxus*), improperly named a Berry. *a.* The Berry-like Receptacle.

298. EXPLANATION OF THE PLATES. PLATE VIII.

- Fig. 28. The Fruit of *Fragaria* (Strawberry), improperly styled a Berry. *a. a.* The Seeds. *b.* The Berrylike, or Pulpy Receptacle.
29. A Legume. *a. a.* The superior suture, to which the seeds are attached.
30. A Silique. *a. a. b. b.* The Seeds attached to both sutures.

FOLIATION.

Obs. The Leaves are cut transversely.

- | | |
|----------------------------|---|
| Fig. 14. A Convolute leaf. | Fig. 23. Involute <i>opposite</i> leaves. |
| 15. A Revolute leaf. | |
| 16. An Involute leaf. | 24. Involute <i>alternate</i> leaves. |
| 17. A Conduplicate leaf. | |
| 18. An Equitant leaf. | 25. Revolute <i>opposite</i> leaves. |
| 19. An Imbricated leaf. | |
| 20. An Obvolute leaf. | 26. Equitant <i>two-edged</i> leaves. |
| 21. A Plaited leaf. | |
| 22. Convolute leaves. | 27. Equitant <i>triquetrous</i> leaves. |

PLATE IX.

CLASSES.

Obs. The Number, Proportion, Connection, and Situation of the Stamens are here represented, as they occur in the different Classes of the Sexual System.

- | | |
|--------------------|--|
| Fig. 1. Monandria. | Fig. 18. Polyadelphia. |
| 2. Diandria. | 19. Syngenesia. |
| 3. Triandria. | 20. Gynandria. |
| 4. Tetrandria. | 21. Monoecia. |
| 5. Pentandria. | 22. Dioecia. |
| 6. Hexandria. | 23. Polygamia. |
| 7. Heptandria. | 24. Cryptogamia. A delineation of each order is given here. |
| 8. Octandria. | A. Filices. |
| 9. Enneandria. | B. Musci. <i>a.</i> The Calyp- tre. |
| 10. Decandria. | C. Algæ. |
| 11. Dodecandria. | D. Fungi. <i>a.</i> The Pileus. <i>b.</i> The Curtain. <i>c.</i> The Stipe. <i>d.</i> The Wrapper. |
| 12. Icosandria. | |
| 13. Polyandria. | |
| 14. Didynamia. | |
| 15. Tetradynamia. | |
| 16. Monadelphia. | |
| 17. Diadelphia. | |

BOTANICAL INSTRUMENTS.

Fig. 25. A Knife.

26. A pair of Nippers, or Forceps.

27. A Needle.

PLATE X.

THE PARTS OF FRUCTIFICATION OF MOSSES.

Obs. All the Figures are magnified.

- Fig. 1. A Male Flower of *Phascum crispum* very much magnified. *a. a.* Anthers. *b. b.* Diaphyses, or Succulent Threads. *c.* One leaflet of the Perichætium.
2. A Female Flower of *Phascum crispum* very much magnified. *a.* The Germen. *b.* The Style. *c.* The Stigma. *d.* The Adductors, or barren Pistils. *e.* A single leaflet of the Perichætium.
3. The Capsule, &c. of *Phascum crispum*. *a.* The Sheath. *b.* The Peduncle. *c.* The Capsule. *d.* The Rudiment of a lid. *e.* The Calypstre.
4. An Anther discharging its pollen, accompanied by a Paraphysis ending in a globular head.
5. A Stamen with the Anther ready to burst, accompanied by a filiform Paraphysis. *a.* The Filament. *b.* The Anther.
6. A Capsule of *Hedwigia Lapponica* with a naked Peristome.
7. The Simple Peristome of *Tetraphis* with four teeth, and part of the Case.
8. The Capsule of *Splachnum Ampullaceum* without its lid. *a.* The Case. *b.* The Apophysis. *c.* The Peristome.
9. The Simple Peristome of *Splachnum* with eight inflected teeth.
10. The Simple Peristome of *Grimmia* with sixteen teeth.
11. The Simple Peristome of *Tortula* with twisted cilia.
12. *a.* The Lid of *Dicranum purpureum* (*Mnium purpureum* Lin.) with *b.* its ring.
13. The Simple Peristome of *Trichostomum* with bifid erect teeth.
14. The Double Peristome of *Leskea*. *a.* The outer toothed peristome. *b.* The inner ciliated peristome.

- Fig. 15. The Double Peristome of *Fontinalis*. *a*, The outer toothed peristome, part of the teeth being cut off to shew more plainly *b*. The inner reticulated peristome.
16. The inner Peristome of *Koelreutera*, with sixteen flat equal cilia.
17. An hermaphrodite Flower of *Bryum trichodes* Lin. (*Webera* Hedw.) *a. a. a. a.* Anthers. *b*. The Pistil. *c. c.* Adductors. *d. d.* Succulent Threads or Paraphyses. *e*. A leaflet of the Perichætium.
18. The Capsule, &c. of *Splachnum palustre* without its lid. *a*. The Case. *b*. The Column. *c*. The torn Calyptra. *d*. The small orb terminating the peduncle. *e*. The Peduncle. *f*. Part of the Perichætium.
19. An Anther of *Sphagnum palustre* discharging its pollen.
20. A Budlike Male Flower of *Bryum striatum* (*Grimmia* Hedw.) with the perichætium entire. *a*. Leaflets of the perichætium. *b*. A Radicle.
21. A Male Flower of *Bryum rurale* Lin. (*Barbula* Hedw.)
22. A Capituliform Male Flower of *Mnium androgynum* Lin. (*Bryum*. Hedw.)
23. *a*. An Echinate Seed. *b*. A Seed marked with circular depressions.
24. *a. b. c.* Seeds of Mosses with their cotyledons.

PLATE XI.

SEEDS.

Acotyledonous Seeds.

- Fig. 1. Seeds of *Ruppia maritima*. *a*. A Nut cut transversely. *b*. A Seed clothed with its proper membrane. *c*. The Vitellus viewed anteriorly, with the chink in the vertex, separating the embryo from the body of the vitellus. *d*. The embryo a little elevated.
2. Seeds of *Zannichellia palustris*. *a*. A Seed denuded by removing half of its capsule. *b. c.* The embryo viewed on both sides. *d*. The embryo with the turns of the radicle unfolded.

Monocotyledonous Seeds.

3. Seeds of *Sagittaria sagittifolia*. *a*. An entire capsule. *b*. The capsule opened, shewing the situation and figure of the seed. *c*. The seed furnished with the navel-cord. *d*. The conduplicate embryo denuded, and its extremities drawn asunder.

Fig. 4. Seeds of *Melica nutans*. *a*. The convex shield-bearing part of the seed. *b*. The Albumen cut transversely. *c*. The Shield with the Embryo.

5. Seeds of *Triticum monococcum*. *a*. A Seed with the Shield. *b*. A Seed cut across, shewing the albumen which is mealy, and almost two-parted. *c*. The Shield and Embryo with three radicles. *d*. The germinating seed.

Dicotyledonous Seeds.

6. Seeds of *Lapsana communis*. *a*. An entire seed. *b*. The same magnified. *c*. A seed cut transversely. *d*. The naked embryo.

7. Seeds of *Salicornia strobilacea*. *a*. The mature calyx viewed on its superior, and inferior parts. *b*. The seed. *c*. The seed magnified. *d*. A vertical section of the seed, with the figure and situation of the embryo, and the central albumen. *e*. The detached embryo.

Obs. In these two figures the *radicle* is inferior; and the embryo in fig. 6. is straight, in fig. 7 crooked.

8. The Nut and Kernel, or Seed, of *Corylus avellana* (Hazel). *a*. The Seed with its Navel-cord within the Nut. *b*. One of the Cotyledons with the Embryo. *c*. The Radicle. *d*. The Plumule of the embryo.—The radicle is superior.

9. Seeds of *Citrus medica* (Lemon). *a*. An entire Seed. *b*. A Seed with its internal membrane, the chalaza, and navel-cord. *c*. A Seed cut transversely. *d*. The embryo denuded.

10. Seeds of *Phaseolus vulgaris* (Kidney Bean). *a*. A Seed with a view of its umbilicus, accompanied above by a pit, and below by two callous dots. *b*. The Cotyledons unfolded, with the embryo. *c*. The curved embryo detached, and magnified.

11. Seeds of *Prunus domestica* (Plumb Tree). *a*. One valve of the Putamen with the entire seed and the navel-cord. *b*. A vertical section of the seed, with the embryo, and the thin albumen placed about the radicle. *c*. One Cotyledon with the embryo. *d*. The Plumule, and radicle detached, and magnified.

12. Seeds of *Cucumis sativus* (Cucumber). *a*. An entire seed. *b*. The nucleus, covered by its proper membrane, within the shell. *c*. The Embryo denuded. *d*. The Cotyledons viewed on the internal side, with

the embryo, which has a small acuminate plumule and a short, compressed, centrifugal radicle.

A Polycotyledonous Seed.

Fig. 13. A Nut and Seed of *Pinus mariana*. *a.* The Putamen with its membranous wing, opened so as to shew the seed. *b.* The Albumen cut transversely. *c.* The Albumen cut longitudinally. *d.* The detached Embryo.—The Cotyledons are three, very short, angular, fleshy; the radicle is nearly cylindrical, long, inferior.

FUNGUSES.

14. An Agaric envelopped in a Wrapper, part of which is removed.

a. a. a. The Wrapper. *b.* The Pileus. *c.* The Gills. *d.* The Stalk.

15. A perpendicular section of an Agaric, with the gills single, and in pairs.

a. A fixed Gill. *b.* A Decurrent Gill. *c.* A Solid Stalk. *d.* The Ring, or remains of the Curtain.

16. A perpendicular section of an Agaric.

a. a. Loose Gills, three or four in a set. *b. b.* The Curtain. *c.* A Tubular Stalk.

17. *a.* Uniform Gills fixed to a collar. *b.* Regular Gills, two in a set, and fixed to a collar. *c.* Regular Gills, three in a set, and fixed to a collar. *d.* Regular Gills, four in a set, and fixed to a collar.

e. Irregular Gills, two, three, and four in a set, fixed to the stalk. *f.* Anastomosing Gills. *g.* Branched, or bifid Gills, fixed to the stalk.

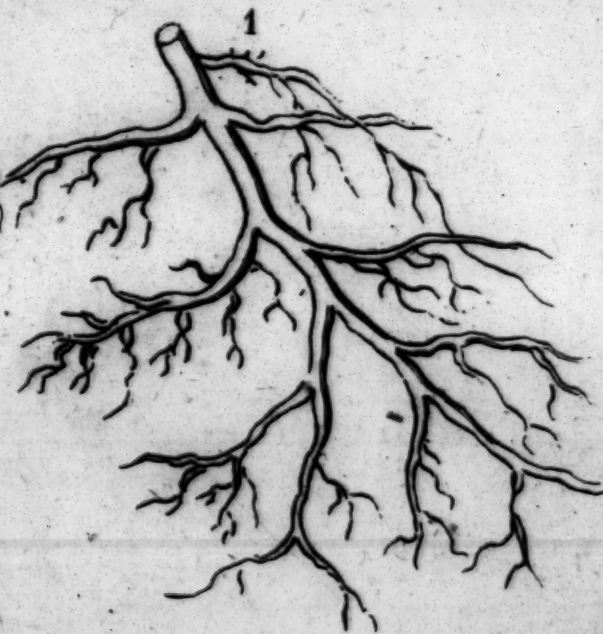
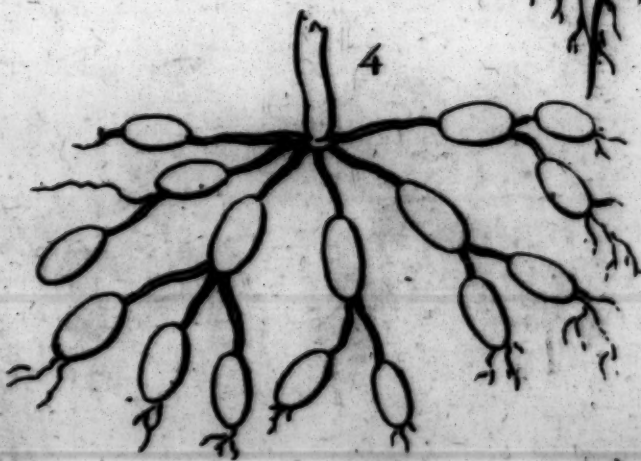
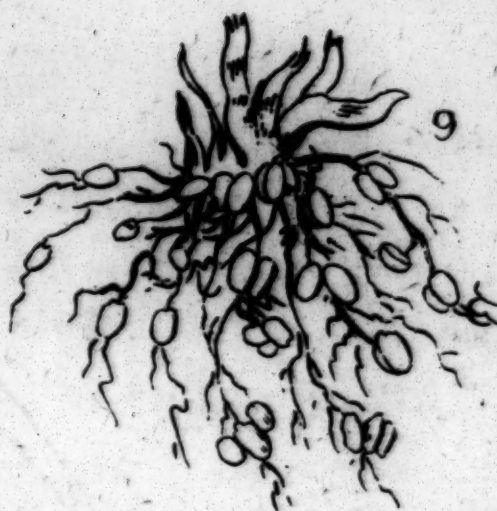
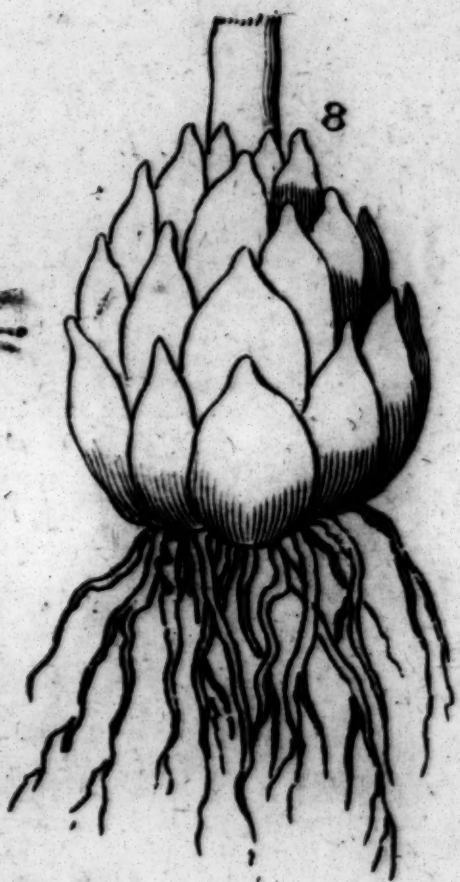
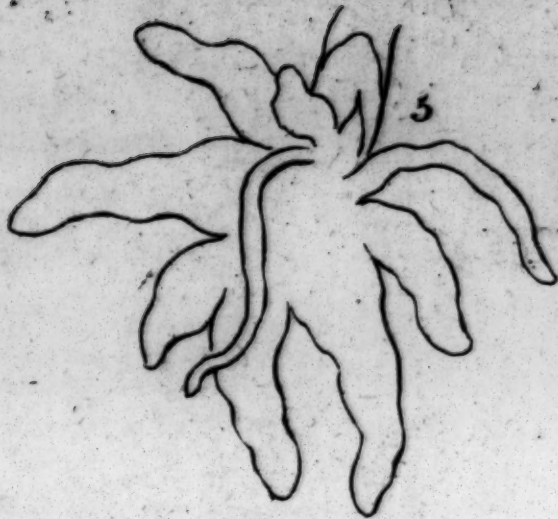
18. A Boletus. *a.* The Pileus. *b.* The Pores. *c.* The Stalk.

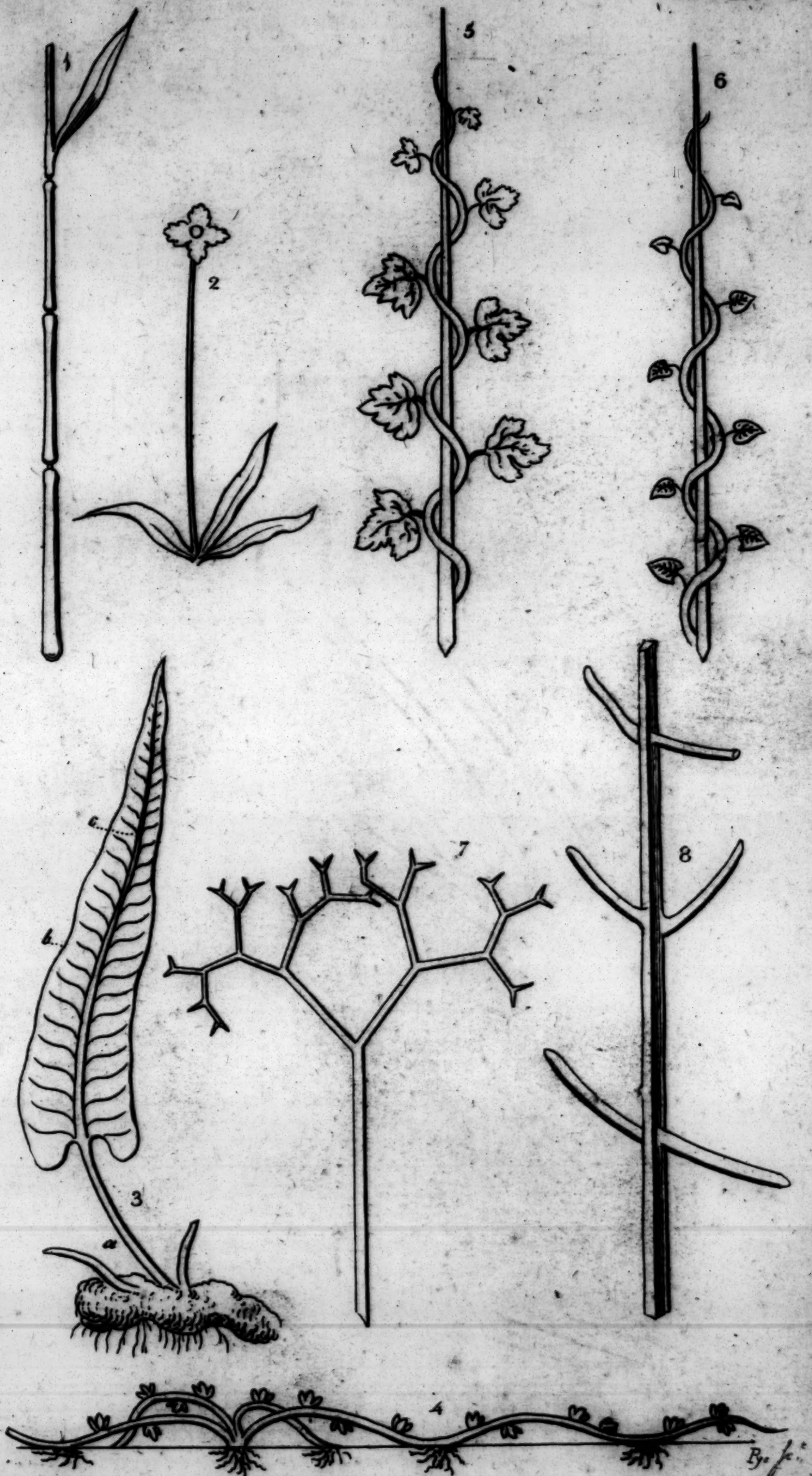
19. A Hydnum. *a.* The Pileus. *b.* The Prickles. *c.* The Stalk.

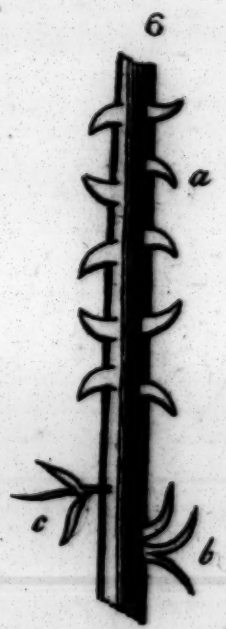
PLATE XII.

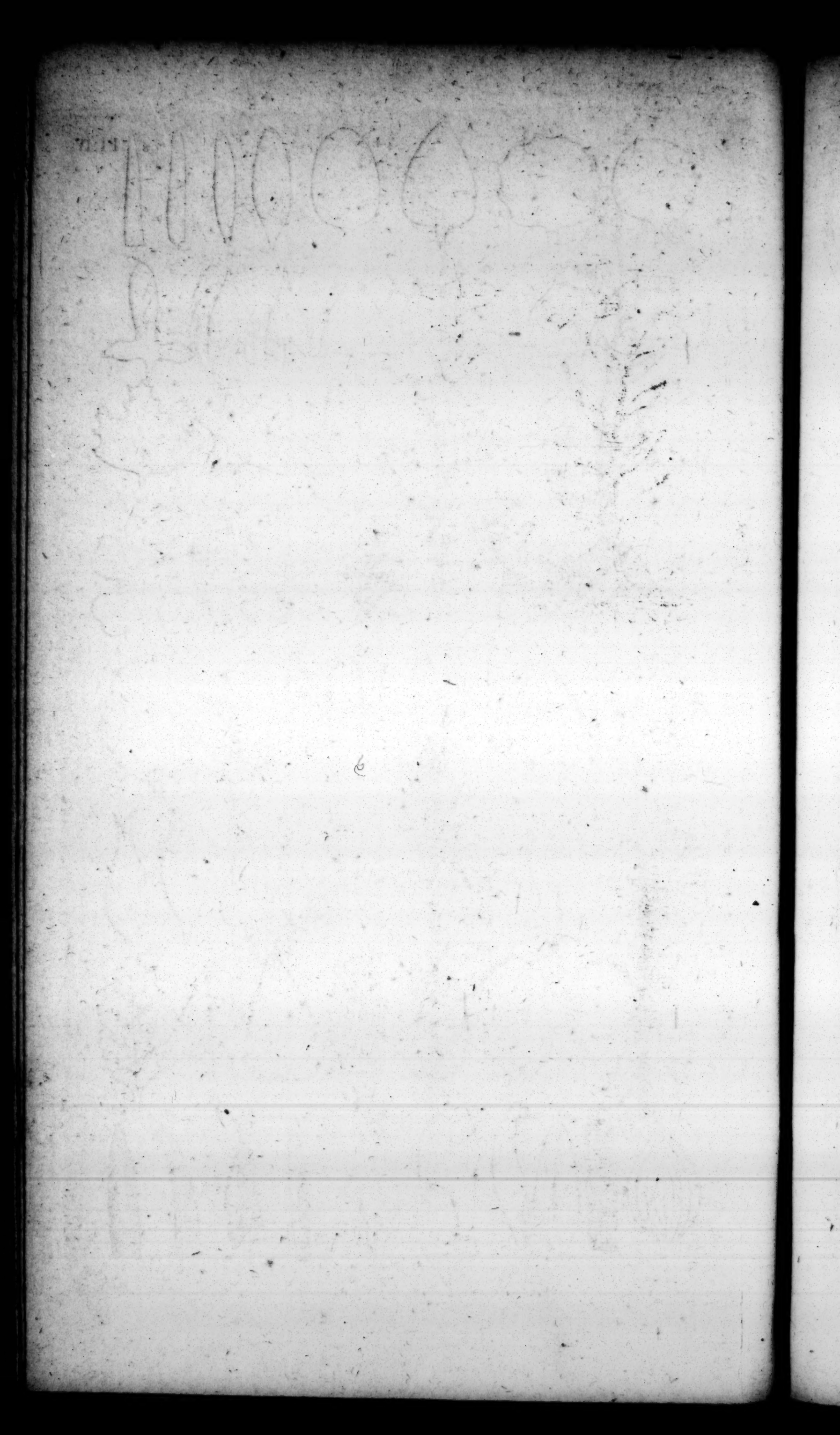
1. A Pocket Microscope, with the method of holding it, and the object to be examined, in the same hand.

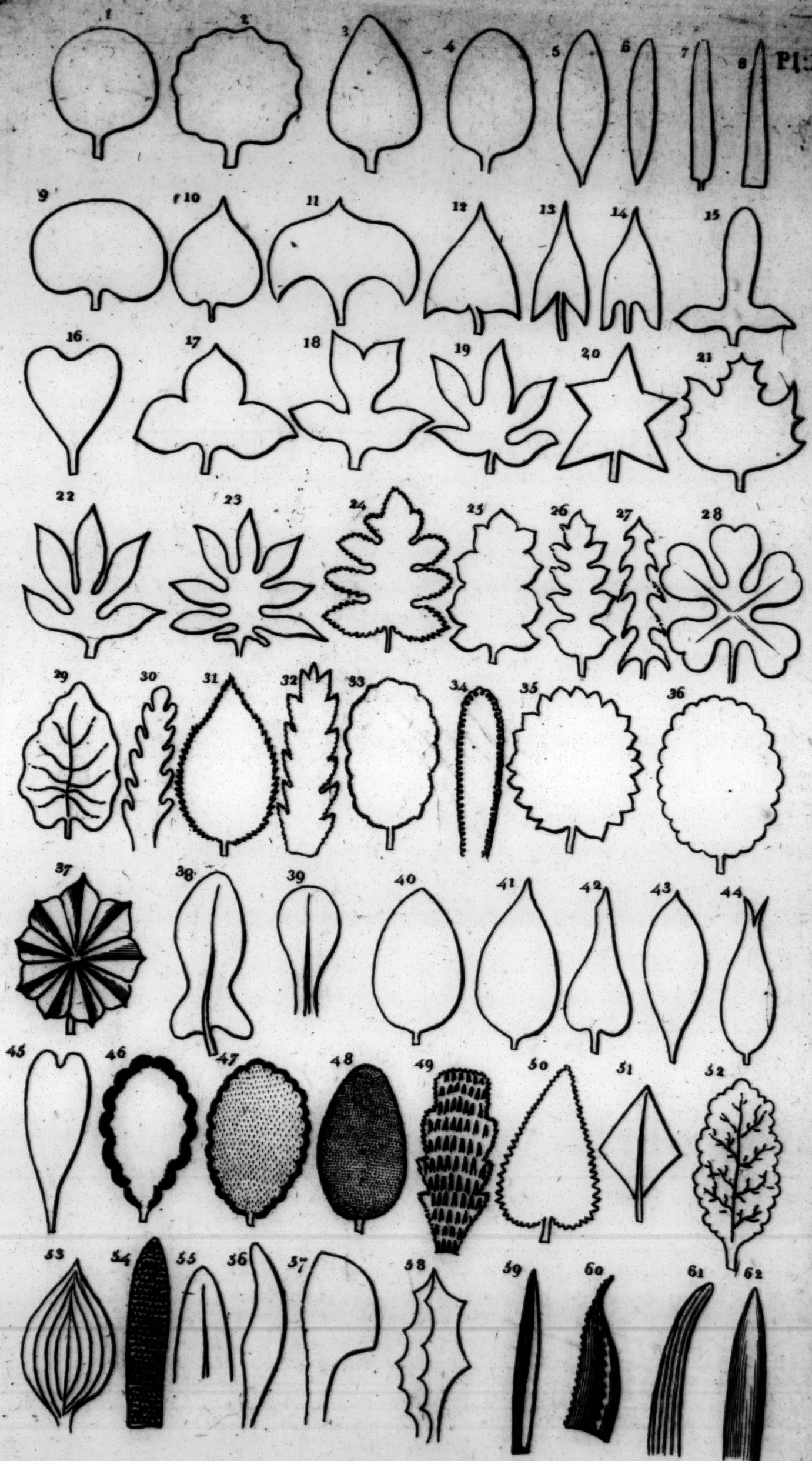
2. The Microscope and a plant applied to the eye with one hand, whilst the other hand is employed in displaying the parts of the plant with the botanical needle.

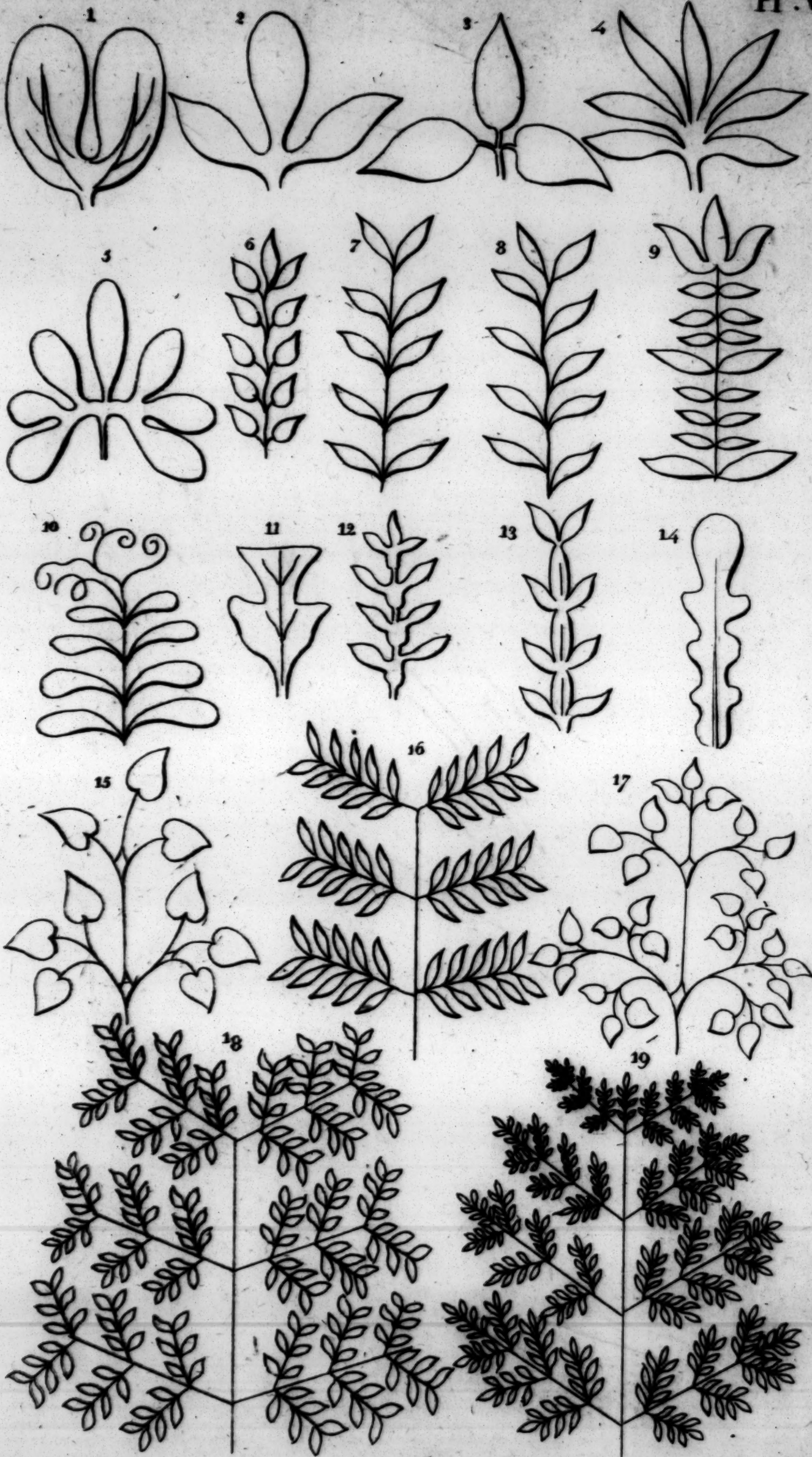


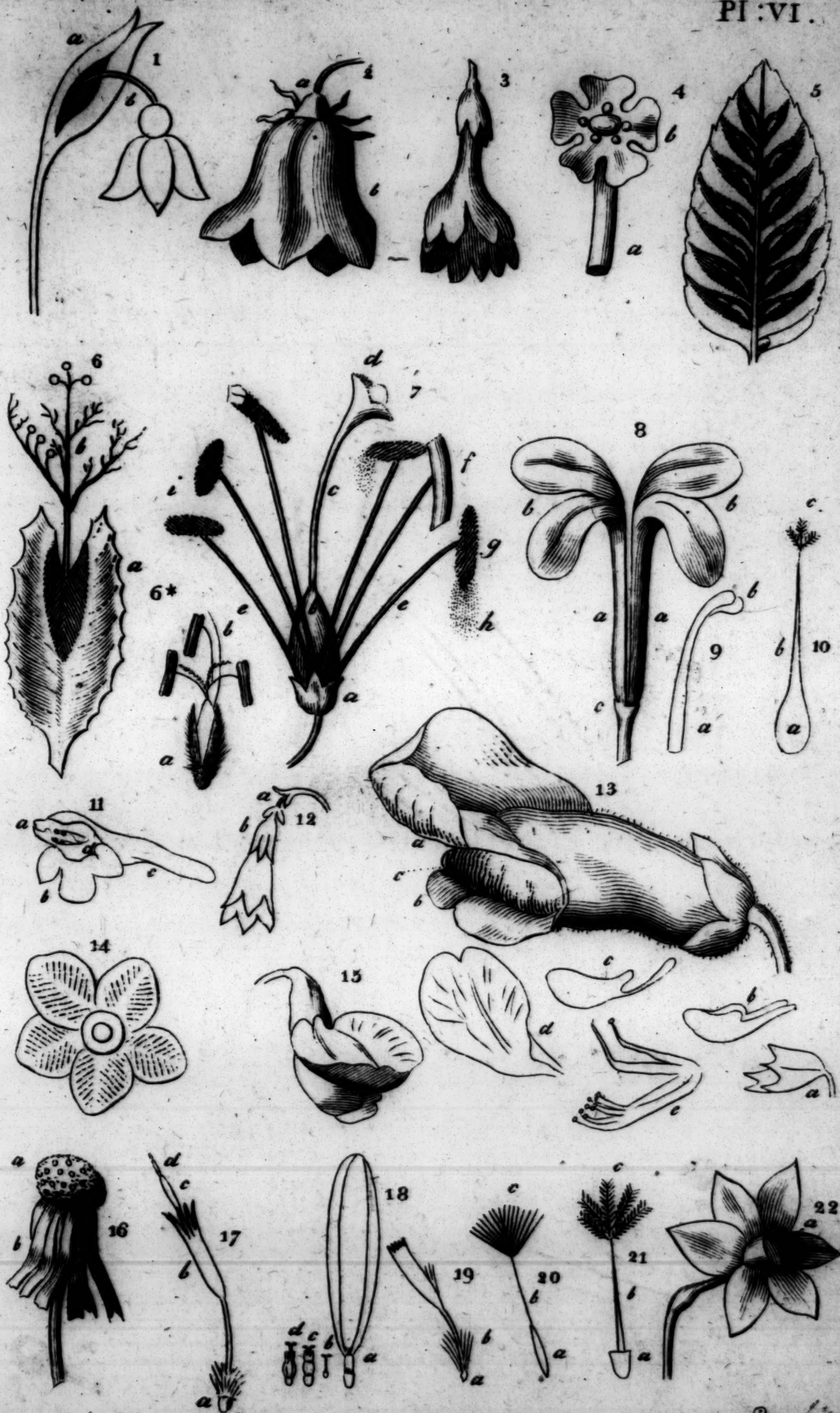


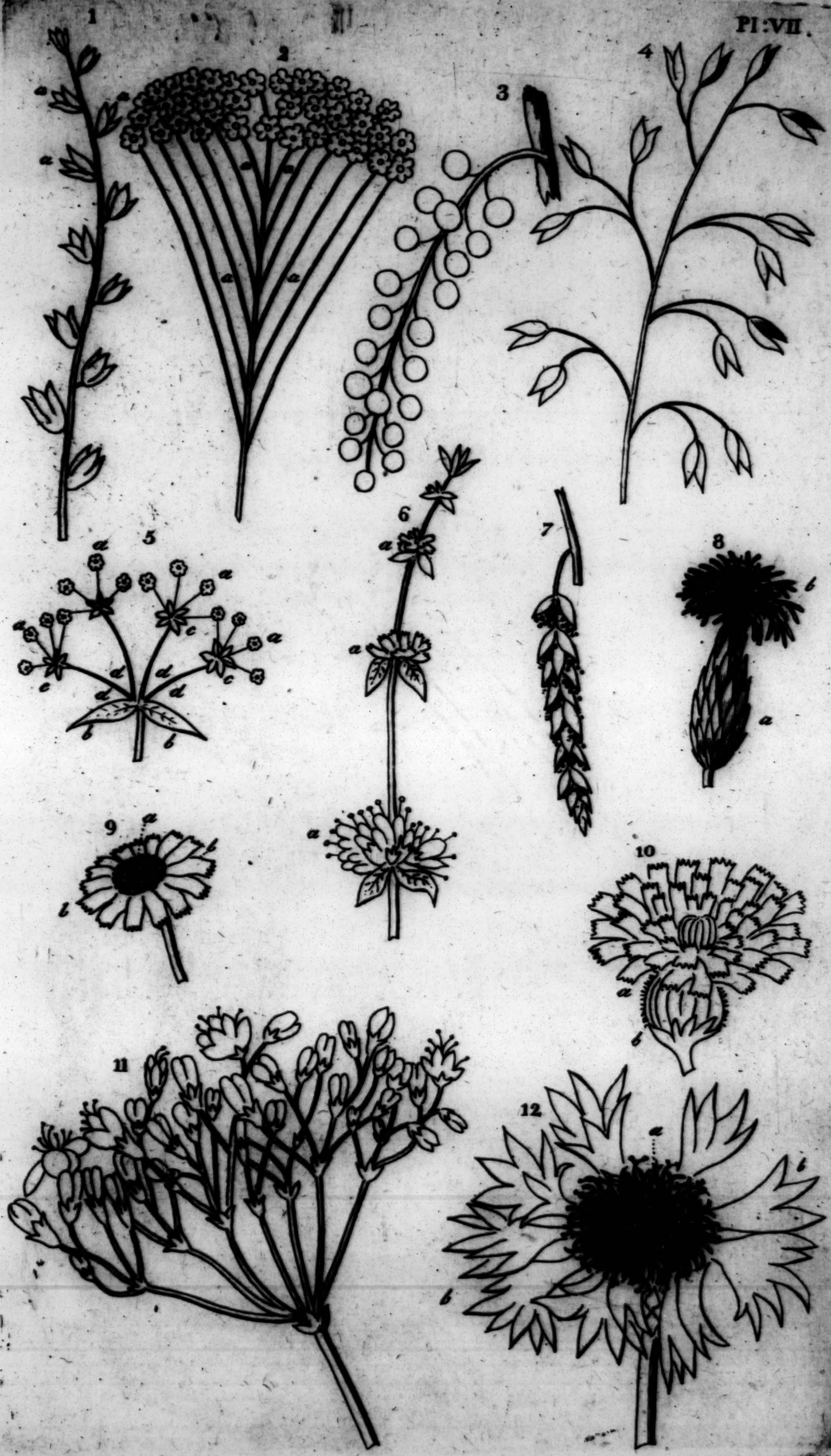




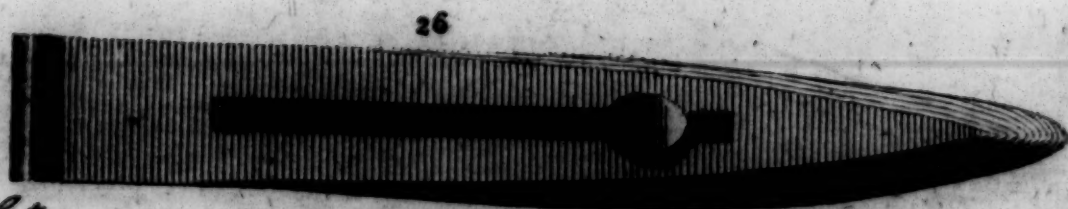
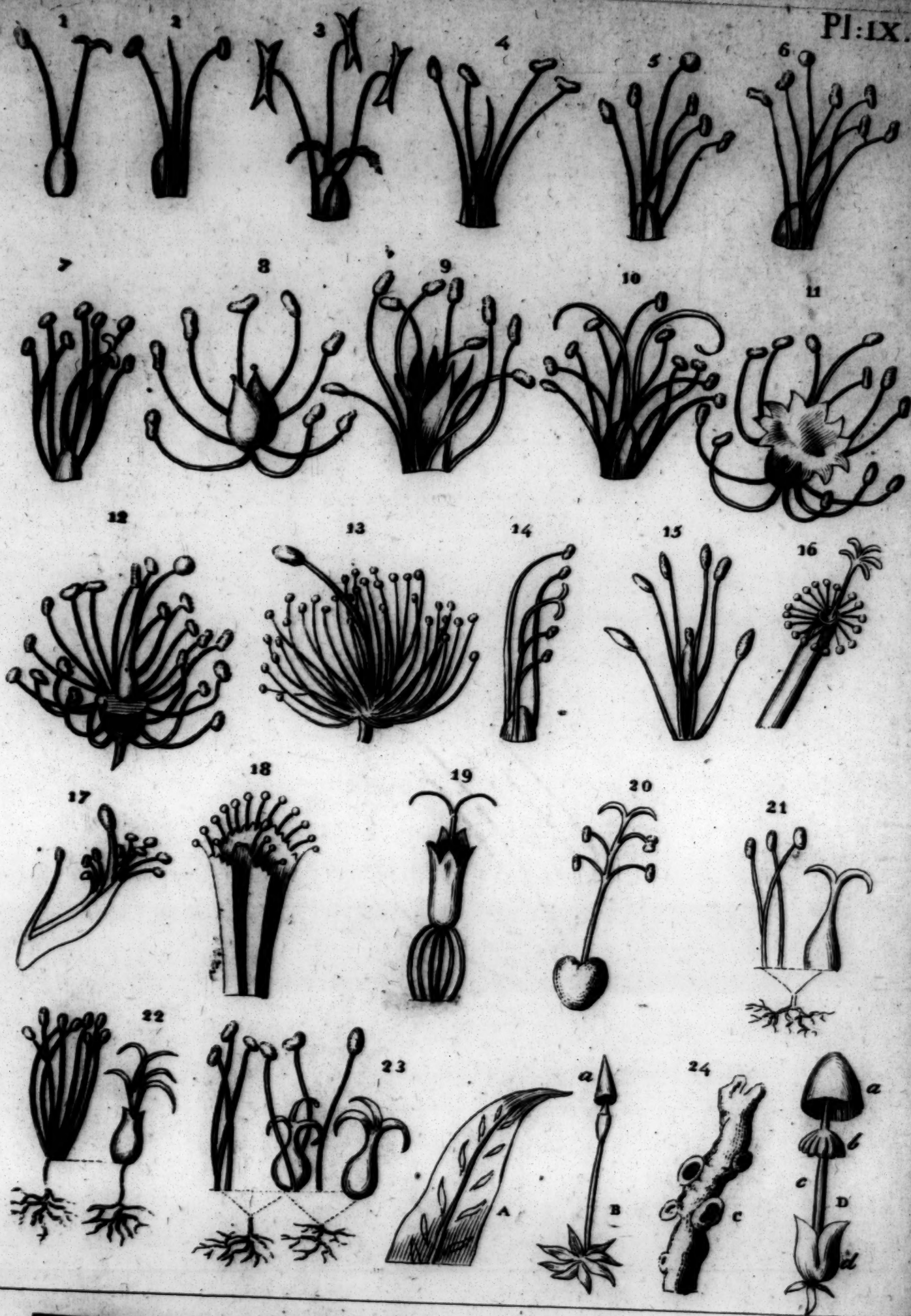




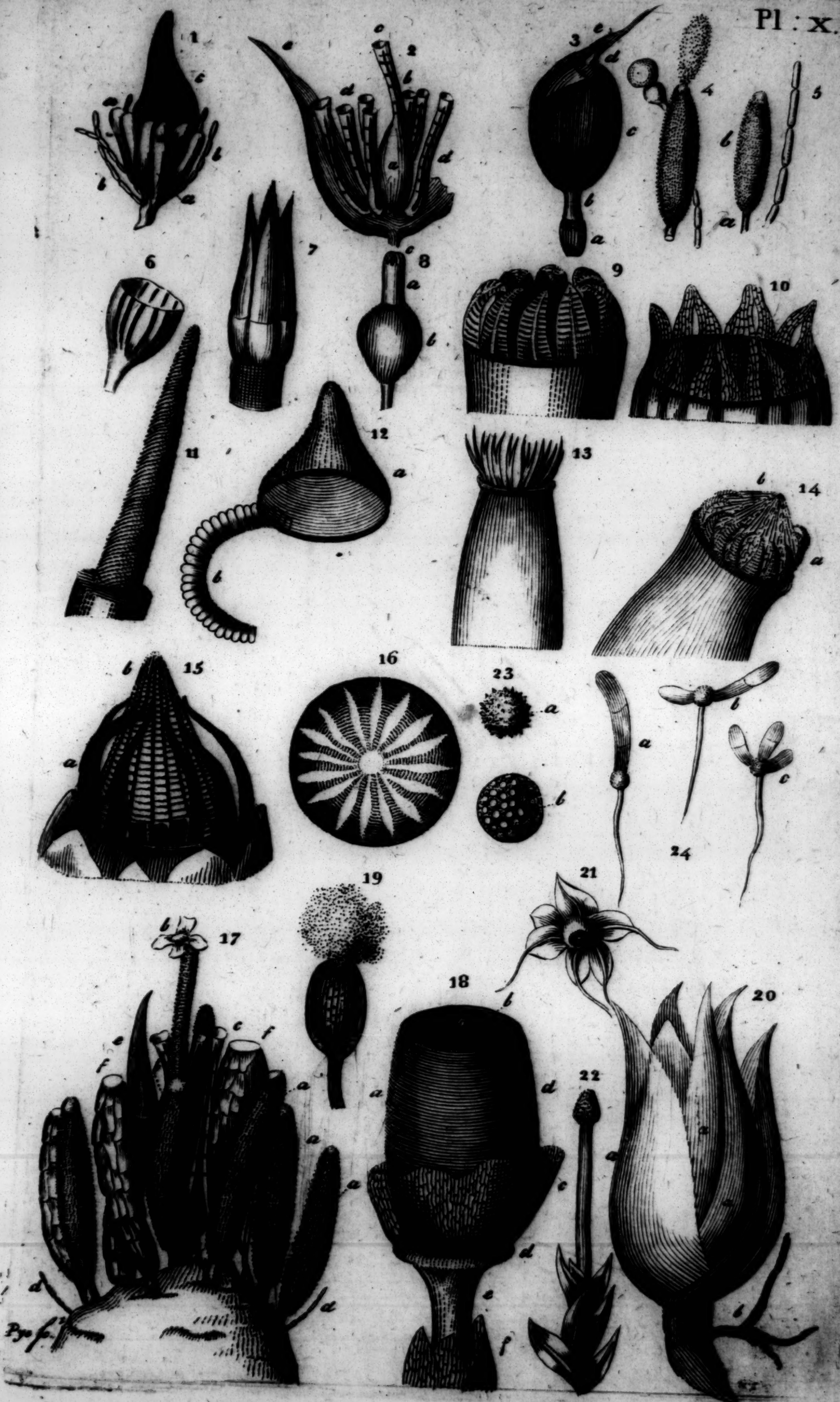








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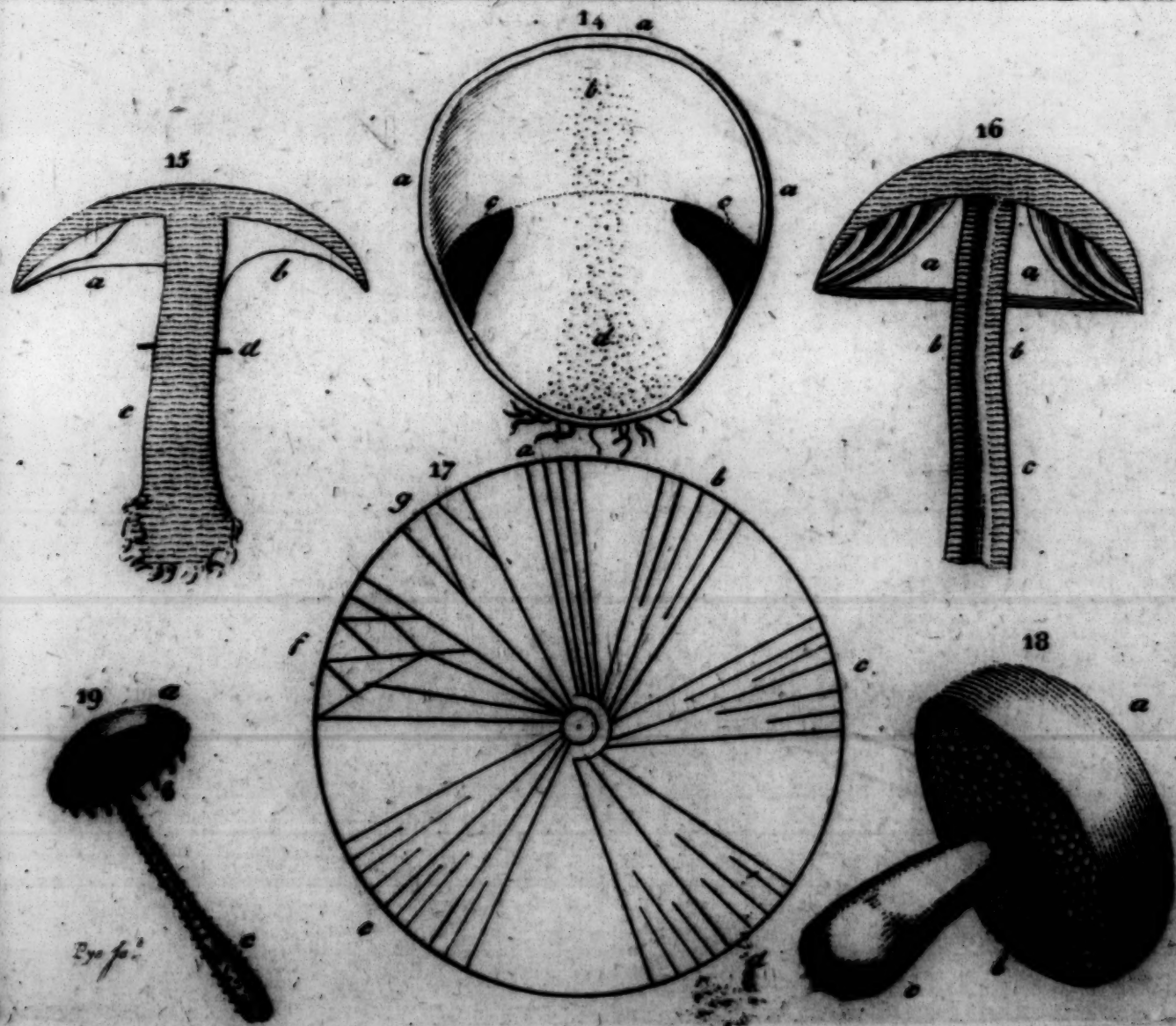
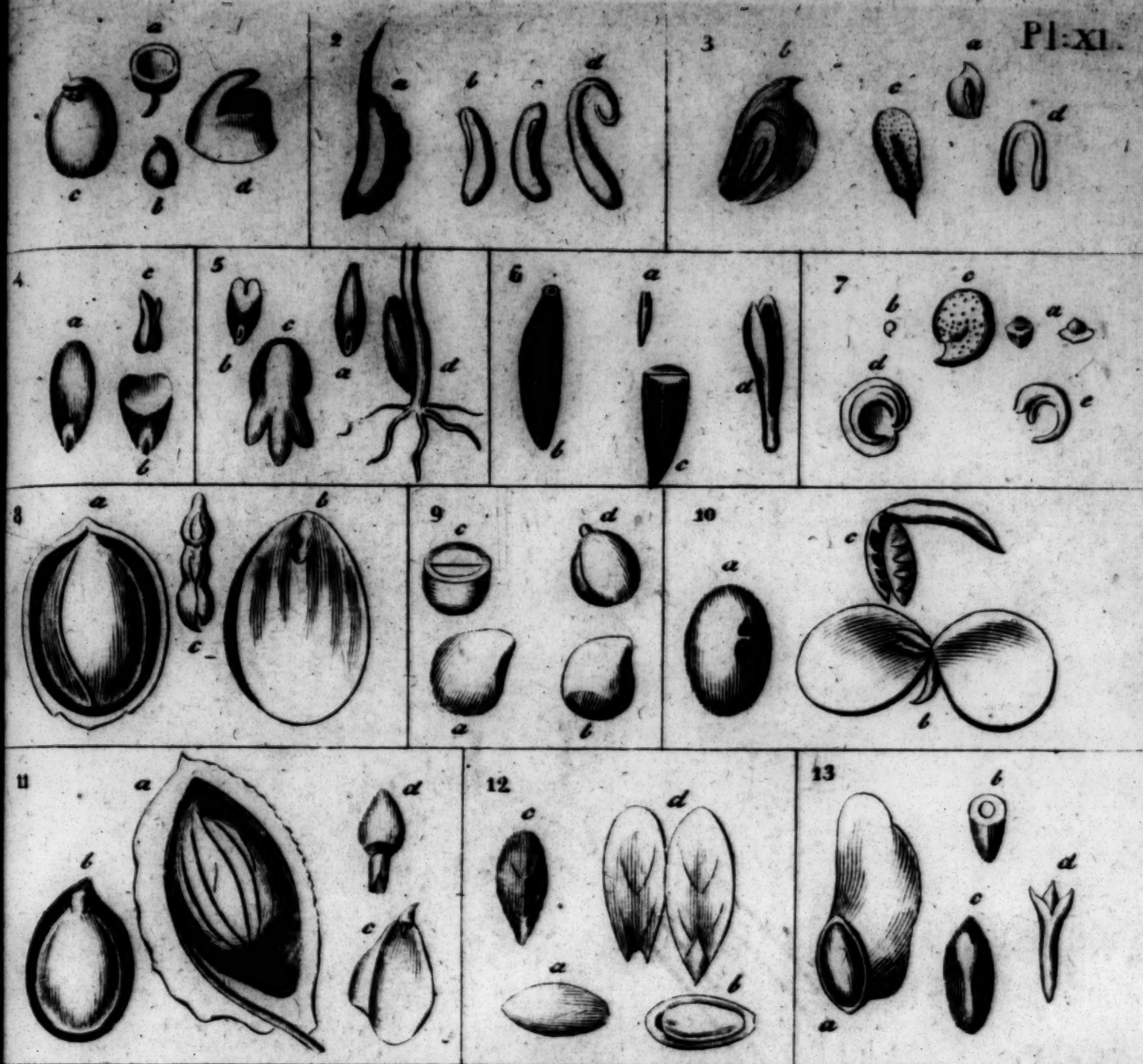


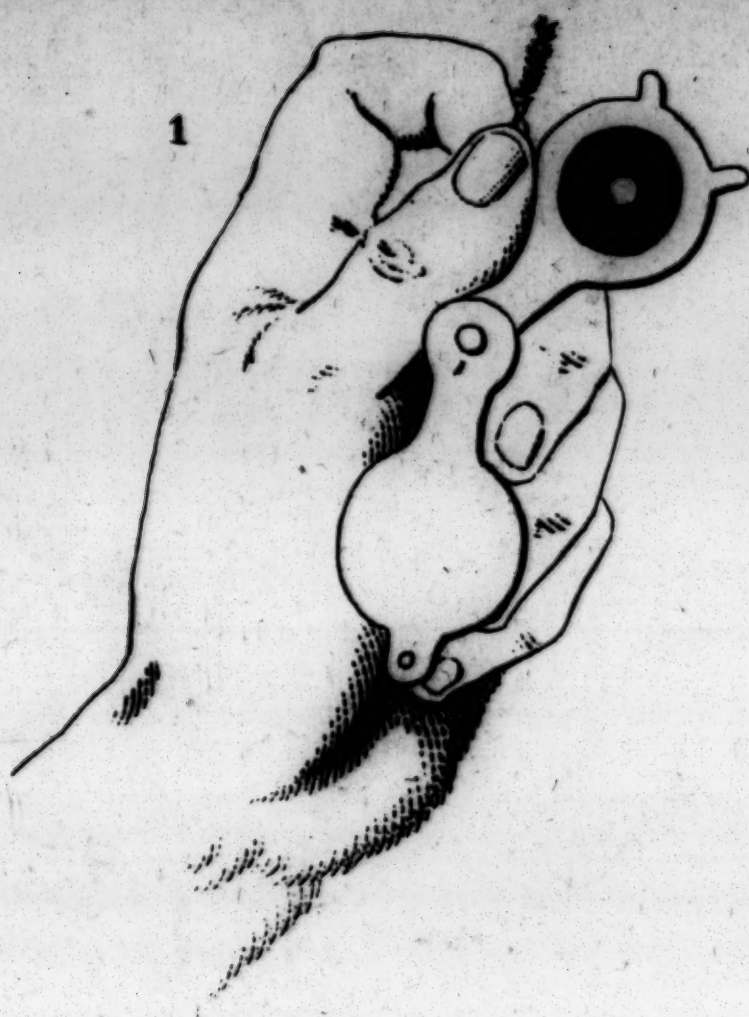


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